

City of Biddeford
Planning Board
May 15, 2024 6:00 PM City Hall
Council Chambers, & Zoom
<https://biddeford.zoom.us/j/94983531202?pwd=Q3ZyejcyUVpBaUVVMHduYXJhSzB4UT09>
Webinar ID 949 8353 1202; Passcode 223739

STATUS: Planning Board Meeting, Wednesday, May 15, 2024, 6:00 PM, City Council Chambers & Zoom

- 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 Meeting Minutes from May 1, 2024
[5-1-24-Meeting Minutes-DRAFT.pdf](#)
- 6. OPEN PUBLIC HEARING**
 - 6.A. 2024.17 The Biddeford Planning Board will have the SECOND READING in a Public Hearing to review and discuss a proposed zone change from MSRD-2 to MSRD-1 at 118 Alfred Street (Tax Map 38, Lot 303-1)

[118 Alfred Rezoning Dominos PB FINAL Hearing 5-15-24.pdf](#)
 - 6.B. 2024.26 Biddeford Planning Board will have the FIRST READING for an amendment to Article XII-Floodplain Management Ordinance
[Floodplain Management Ordinance FIRST READING PB MEMO 5-15-2024.pdf](#)
[Floodplain Management Ordinance Planning Board Hearing 1 on 5-15-24 FINAL red and blue.pdf](#)
- 7. CLOSE PUBLIC HEARING**
- 8. NEW BUSINESS**
 - 8.A. 2024.10 The Biddeford Planning Board will review and discuss a Preliminary Site Plan Application for UNE to build Tennis Courts at 16 Old Pool Road (Tax Map 9, Lot 13) in the IN Zone.
[2024.10 UNE Preliminary Staff Report.pdf](#)
[2024_02_15 UNE Tennis Courts - Site Plan Application.pdf](#)
[2024-02-14_UNE Tennis Plan Set.pdf](#)
 - 8.B. 2024.25 The Biddeford Planning Board will review and discuss a Shoreland Zoning/Greatest Practical Extent Application for Jonathan & Elizabeth Beebe to raze and reconstruct the existing home, moving it towards the street side setback line to the greatest extent practicable. The property is located at 99 Fortunes Rocks Road (Tax Map 65, Lot 2) in the Coastal Residential and Shoreland Overlay Zone.

[2024.25 Beebe 99 Fortunes Rocks Road Shoreland Zoning Permit 5-15-24 FINAL Staff Report.pdf](#)

[Combined Set Final.pdf](#)

[Plan Set.pdf](#)

- 8.C. 2024.14 The Biddeford Planning Board will meet to review and discuss a Site Plan Review submitted by BHV Biddeford, LLC for an internal change of use to a pickle ball court at 420 Alfred Street, Five Points Shopping Center (Tax Map 20, Lot 26-1) in the Industrial 3 Zone.

[2024.14 BHV Biddeford LLC 420 Alfred Street Report 5-17-24 FINAL.pdf](#)

[2024-04-29 Gym & Pickleball Application Binder.pdf](#)

[2024.14 Pickle ball facility Five Points Shopping Center FOF - COA.pdf](#)

[2024-04-29_05142.pdf](#)

[2024-04-29 Wastewater Demand Memorandum.pdf](#)

- 8.D. 2024.20 The Biddeford Planning Board will meet to review and discuss a Conditional Use Application for JAR Co. CV LLC to open an Adult Use Retail Cannabis Shop at 420 Alfred Street (Tax Map 20, Lot 26-1) in the Industrial 3 Zone.

[2024.20 JAR Co. CV LLC Staff Report.pdf](#)

[2024.20 JAR Co. CV LLC adult use FOF - COA.pdf](#)

[3-26-24 Application Package.pdf](#)

- 8.E. 2024.24 The Biddeford Planning Board will meet to review and discuss a Conditional Use Application for Orange Fitness to open Fitness Center/Gym at 420 Alfred Street (Tax Map 20, Lot 26-1) in the Industrial 3 Zone.

[2024.24 Orange Fitness Staff Report.pdf](#)

[2024.24 Orange Fitness FOF - COA.pdf](#)

[Application Package.pdf](#)

9. OTHER BUSINESS

10. 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

205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115

Planning Board Meeting Meeting Minutes

DRAFT

Date: May 1, 2024
Time: 6:00 PM
Location: Council Chambers & Zoom

1. Pledge of Allegiance
2. Declaration of Quorum/Voting Members
Quorum Present: Larry Patoine, Chair, Susan Deschambault, Alexa Plotkin, Stephen Beaudette & Dylan Doughty, Alternate Member
Dylan Doughty will be voting tonight for Roch Angers
Staff Present: David Galbraith & Nan Whitten
Chair Patoine opened the meeting at 6:04 PM
3. Adjustments to the Agenda-None
4. Planner's Business
 - AVESTA Housing numbers were distributed
5. Consent Agenda
 5. A. Approval of Meeting Minutes from 4-17-24MOTIONS: 6:06PM
Motion-Plotkin -Motion to approve minutes as presented
Second-Deschambault
Motion passed unanimously
6. Unfinished Business-Open Public Hearing
 6. A. 2024.17 The Biddeford Planning Board will have a continuation of the FIRST READING in a Public Hearing to review and discuss a proposed change of zone from MSRD 2 to MSRD 1. This item was tabled at the April 17, 2024 Planning Board meeting. The property is located at 118 Alfred Street (Tax Map 38, Lot 303-1)
MOTION: 6:07 PM
Motion-Deschambault-Move to remove from the table item #2024.17
Second-Doughty
Vote-Motion passed unanimously
 - Galbraith re-introduced the proposal
 - Owner wants to stay in the same area as this is the most profitable store for her
 - PUBLIC
 - Chico Potvin from Ward 6, saw confusion in the last meeting wanted to help. Thinks the purpose of the use is very good. Dominos is being asked to vacate to help the traffic in Biddeford. Residential won't go in there and it is

surrounded by commercial businesses. He does not feel it will make a negative impact on the area.

BOARD:

- Doughty wanted more clarity on the other sites looked at, clarified that the City is assisting this Business Owner.
- Deschambault- this business has to move this was not there choice. The state and City will be taking this location and it will no longer be standing. There are 19 spaces in the back. Does not feel there will be a negative impact on the neighborhood. This is to make the corner MSRD 1 not the entire neighborhood. This is not a far stretch due to the other businesses in the area. If this is to change to another business it would have to go to Planning Board. She will be advocating for this proposal.

MOTION: 6:20 PM

Motion-Deschambault- To send this proposal to the Council for review with a positive

Second-Doughty

Vote: Motion passed 2-1 (Deschambault & Doughty in favor, Plotkin against)

7. Close Public Hearing 6:22 PM

8. New Business

- 8. A. 2024.22** The Biddeford Planning Board will hold a public meeting to review and discuss a Conditional Use Permit request for Pine Tree Maine 2, LLC to open an adult-use cannabis retail store at 588 Elm Street, (Map 21, Lot 2-1) in the I-1 & B-2 zones.

- Galbraith introduced the project
- There is a split zoning through the middle of the building. The applicant will be using the industrial portion for their business.
- **PUBLIC**
- Lindsay Holden partner at Pine Tree 2 LLC
- **BOARD**

MOTION: 6:25 PM

Motion-Plotkin-Motion to waive Article XI, Full Site Plan Review. I motion to waive Article XI, full site plan review, as no site improvements are being made.

Second-Doughty

Vote: Motion passed unanimously

Motion-Doughty-Motion to approve the Conditional Use Permit and the Findings of Fact and Conclusions of Law for Pine Tree Maine 2, LLC for an adult-use recreational marijuana retail facility at 588 Elm Street (Tax Map 21, Lot 2-1).

Second-Deschambault

Vote: Motion passed unanimously

- 8. B. 2021.42** The Biddeford Planning Board will hold a Public Meeting and take comments regarding the Final Site Plan Subdivision Application for South Street Village, LLC to create a 195 Unit over 55 Manufactured Housing Park called Hidden

Hills at 413 South Street, (Tax Map 7, Lot 8) in the SR1 & RF Zones with the MHP Overlay.

- Galbraith re-introduced the project
- Galbraith explained all the staff and applicant have done to make this project approvable.
- Matthew Chamberlain and Rick Meek of Terradyne Consulting represented the application.
- No public comments
- Galbraith-Mr. Chamberlain did offer \$25,000.00 per phase but Mr. Angers suggested a higher number.
- Chamberlain mentioned that they have gone back and forth on the FOF. He went through the discrepancies discussed on the FOF.
- Patoine asked what the Board wants the dollar amount should be
- Doughty-did the applicant know of the change in dollar amount prior to the meeting? Chamberlain said just heard about it Thursday.
- Deschambault confirmed that she remembers discussing this at the workshop and is reluctant to change it.
- The Board agreed to keep the dollar amount as is, Chamberlain agreed.
- Galbraith explained the portion of the phases and escrows going for 10 years.
- Beaudette fine with it as presented.
- Funds would be returned after 10 years from last payment received
- Each phase is proposed to take 1 year.
- Engineering Division would like a new plan with each phase, Galbraith is recommending keeping #8 as written. They would not be coming back to the Planning Board but to the engineering staff for internal review.
- Board agrees to keep #8 as written.
- #9 phases would go in numerical order, applicant would like to open other phases not necessarily in order. No more than 2 phases are to be open at a time. Planner can change the wording so that phases do not have to go in numerical order.
- Chamberlain asked about a master escrow to cover all phases. Planner is fine with that.
- #3 Waterworks Drive Chamberlain wants clarity. Waterworks drive will be the act grade sidewalk. Galbraith-the City Council must accept Waterworks as City road.
- #7 will be removed this will not be on sewer.
- No TPM needed.
- Patoine, street names are different on plans. Names will be Chamber Lane
- Engineer will correct the plan and resubmit.
- Deschambault-20 units in the first phase, how long to build out 20 units-6-8 weeks to order & deliver, easily 12 months.

MOTION: 6:55 PM

Motion-Plotkin- Motion to APPROVE Case # 2021.42: Hidden Hills Housing Park - Final Plan and Subdivision Review for 195-unit manufactured housing park subdivision at 413 South Street (Tax Map 7/Lot 8) in the RF, SR-1 zones and MHP

Overlay Zone, with the adoption of the Findings of Fact (FOF) and Conditions of Approval (COA) as will be amended.

Second-Beaudette

Vote: Motion passed unanimously.

8. C. 2023.33 The Biddeford Planning Board will hold a public meeting and take comments regarding a Final Subdivision Application for Beachwood Development, LLC to create an 8-lot residential single-family subdivision at 781 Pool Street (Tax Map 5, Lot 17-2) in the Coastal Residential & Shoreland Overlay zone. Other Business

- Michael Tadema-Weilandt from Terradyne Consulting introduced and updated the Board on the progress they have made since receiving Preliminary Approval.

PUBLIC

- Pete McGuirk 755 Pool Street
- Nancy Irving 11 Maddox Pond Road
- Leah Schaffer-Ward 5

BOARD

- Tadema-Weilandt Answered questions from the public including the 3 pages of questions from Mrs. Irving
- Peter McGuirk again, fire hydrants? fire hydrants determined by Fire Chief
- Galbraith-Conditions of Approval-Jeff Bowley-Single Family homes as covenant on Conditions of Approval. If and when ADU is added the stormwater report will be updated so that the calcs would include the extra usage. Owner-no issue
- Deschambault-will this trigger an amendment to the ordinance-yes
- Bowley wants to look at the FOF again so that the homeowners can do that which is authorized by the state
- Doughty-would the association have to approve ADUs, the HOA could not preclude the homeowners to do what the City allows.
- Plotkin-is there anything in there about additional structures
- Patoine-Mr. Parks' water line goes under Peter Pond in the future would houses on the other side of Peter Pond have access to those water lines, unfortunately no. The developer looked into it but the PUC does not allow it. Pool Street residents can connect.
- Plotkin-Item #4 on the question list from Irving for the Planner to answer

MOTIONS: 7:41 PM

Motion-Plotkin- Motion to Approve: I motion to APPROVE Case # 2023.33 Site Plan and Subdivision Review for Beachwood Development LLC at 781 Pool Street (Tax Map 5, Lot 17-2) in the Coastal Residential and partially within the Limited Residential Coastal Overlay District, with the adoption of the attached Findings of Fact (FOF) amended to address ADUs and stormwater runoff and recommended Conditions of Approval (COA) as written

Second-Deschambault

Vote: Motion passed unanimously

8. D. 2024.01 The Biddeford Planning Board will have a public meeting to review and discuss Final Site Plan request for the proposed expansion of the Biddeford Primary School located at 320 Hill Street (Tax Map 82, Lot 32) in the R-1A Zone.

- Galbraith updated the Board on the progress of the project
- Leah Schaffer of Mobile Studio Design represented the applicant
- Fire Chief recommended drop down bollards which they will use.
- There were no public comments
- Patoine-parking exceeds the ordinance-Schaffer-they are over what the ordinance requirements.
- Plotkin-is this number a minimum-Schaffer-yes
- Deschambault does this add to handicapped parking? Schaffer-No

MOTION: 7:48 PM

Motion-Deschambault- Motion to approve Case # 2024.01 Final Plan Review for Biddeford School Department to create a two-story building addition at the Primary School located at 320 Hill Street (Tax Map 82, Lot 32) / Final Review, with the attached Findings of Fact (FOF) and Conditions of Approval (COA), as written.
Second-Plotkin

Vote: Motion passed unanimously

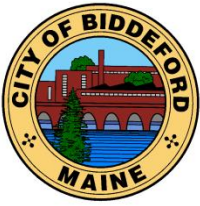
9. Other Business

10. Adjourn 7:49 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.



CITY OF BIDDEFORD

Planning and Development Department

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PLANNING BOARD MEMORANDUM

TO: Chair Patoine and Members of the Biddeford Planning Board

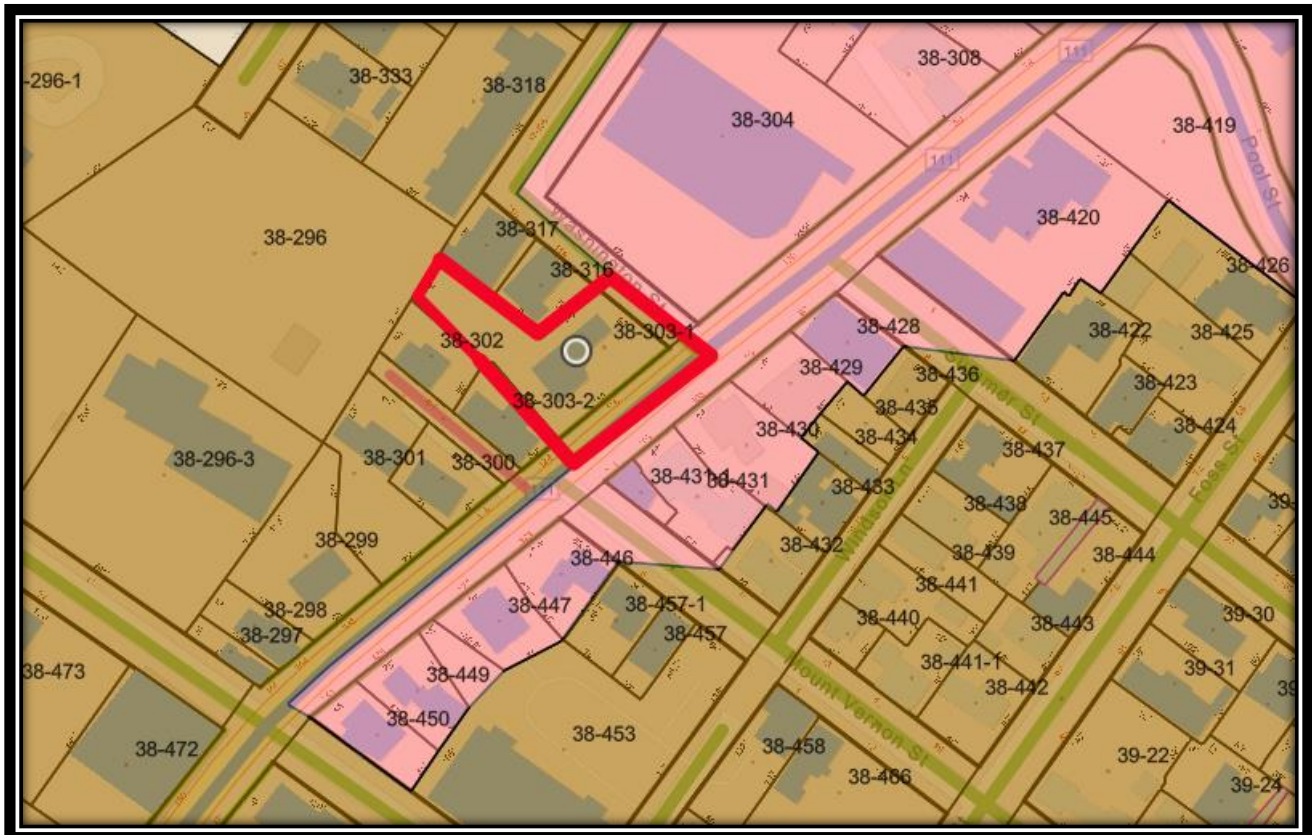
FROM: David C.M. Galbraith, Deputy Director / City Planner

DATE: May 2, 2024

RE: **Case # 2024.17 Rezoning Request / 118 Alfred Street (Tax Map & Lot# 38-303-1) / from MSRD-2 to MSRD-1 / Second Reading**

Hearing Date: May 15, 2024

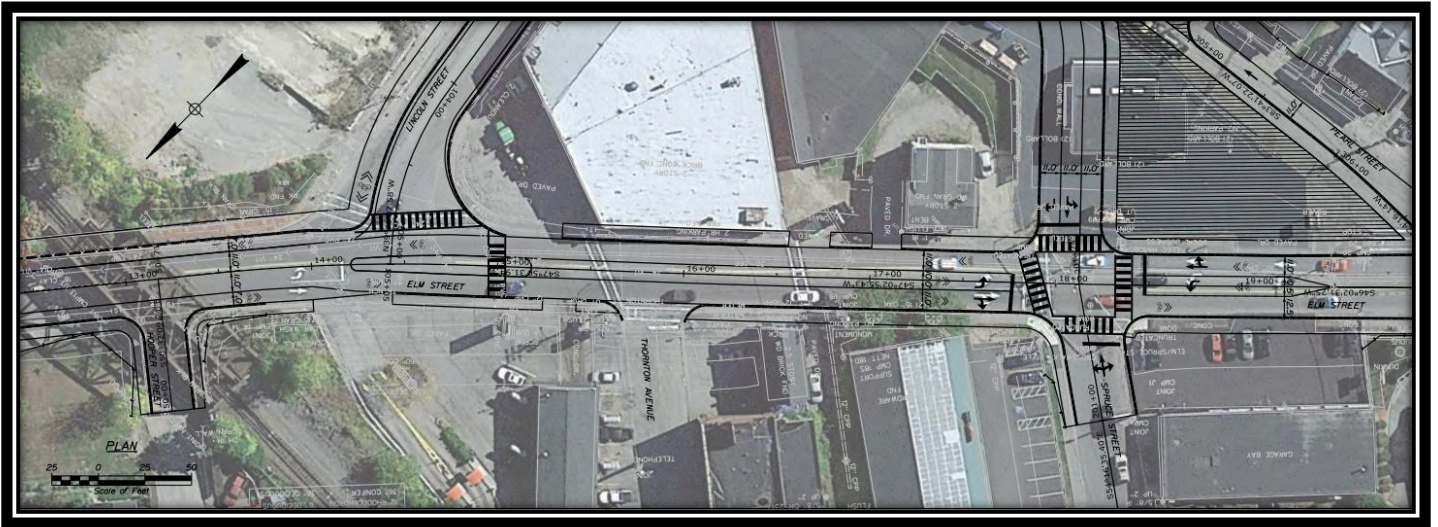
City Staff is proposing to rezone the property located at 118 Alfred Street (Tax Map & Lot# 38-303-1) from MSRD-2 to the MSRD-1 zoning district. This rezoning request was first brought before the Board under "Planner's Business" on March 20, 2024. This meeting included a very brief overview of the rezoning request, the existing use of the property and a discussion of the existing zoning in the immediate area.



118 Alfred Street (highlighted in red) proposed rezoning from MSRD-2 to MSRD-1

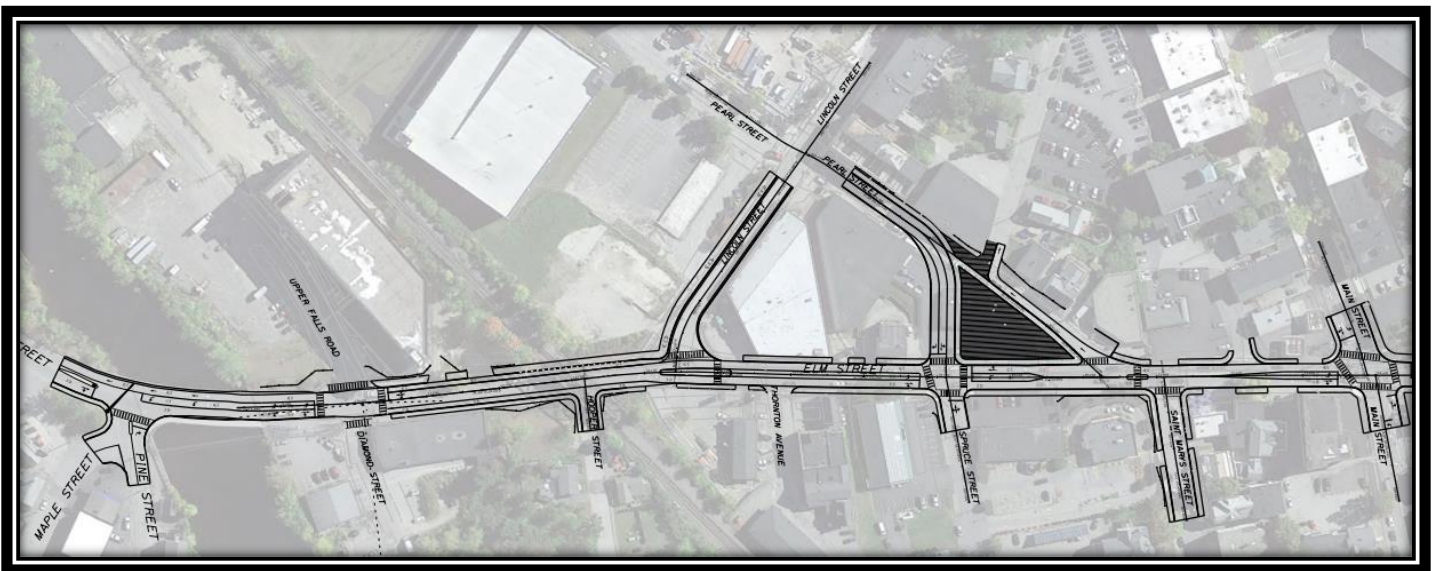
Case # 2024.17 – Rezoning Request / 118 Alfred Street (Tax Map & Lot# 38-303-1) / from MSRD-2 to MSRD-1 / Second Reading
Hearing Date: May 15, 2024

As the Board was made aware, City Staff has been working with the owner of Domino's Pizza, who is currently located at 111 Elm Street, who was/is searching for a new location for her business.



Elm Street Corridor Improvements – Progress Plans – Spruce Street Intersection Upgrades

As previously discussed at the Board meetings of March 20, 2024 (project introduction), April 17, 2024 (preliminary hearing – TABLED), and most recently at the Board's May 1, 2024 meeting (preliminary hearing #2 – Passed 2-1-0), the property owner needs to vacate their existing building due to the planned Elm Street Corridor Improvement Project. The Corridor Project extends the length of Elm Street from Main Street (Biddeford) to Pine Street in the City of Saco. As illustrated above, the existing Domino's Pizza (top right hand corner of above image) is proposed to be removed and replaced by an extension of Spruce Street, at the existing intersection. The Spruce Street extension would (as currently designed) need to go through the existing building and would connect to Pearl Street. The primary need for the Spruce Street extension is due to the need to make Lincoln Street a one way road flowing to the north. The existing left turn from Elm Street onto Lincoln Street, and the left hand turn from Lincoln Street onto Elm Street need to be eliminated for more efficient traffic flow.

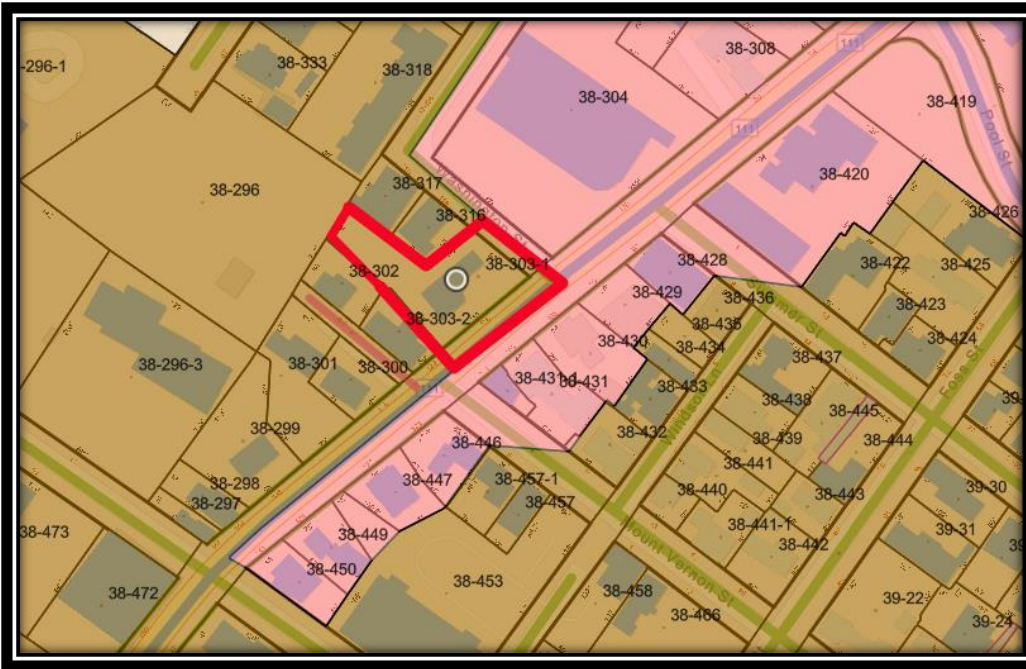


Elm Street Corridor Improvements – Progress Plans – Project Scope

Case # 2024.17 – Rezoning Request / 118 Alfred Street (Tax Map & Lot# 38-303-1) / from MSRD-2 to MSRD-1 / Second Reading
Hearing Date: May 15, 2024

When identifying possible locations for the relocated Domino's store, the only site that seemed to work for the owner is the 118 Alfred Street location. This site was ideal as it keeps her store in the same general neighborhood and customer base, which was key as their existing Biddeford store is their most profitable store under her ownership. The 118 Alfred Street property is currently zoned MSRD-2 rezone but the Use (Restaurant) is currently not permitted in that zone. However, the property is surrounded on 2 sides with properties located in the MSRD-1 zoning district, the most notable is the Post Office (Tax Map & Lot # 38-304), which is located to the immediate north and shown in pink, and additional commercially MSRD-1

zoned properties that extend down the east side of Alfred Street, beyond the subject property, ending at Birch Street. The immediate area would best be described as a mixed use neighborhood primarily made up of multi-family residential buildings and commercial buildings. Therefore, to relocate the business to this location, the zoning would need to be changed from MSRD-2 to MSRD-1.



Proposed Rezoning Area from MSRD-2 to MSRD-1



118 Alfred Street (Tax Map & Lot# 38-303-1) / from MSRD-2 to MSRD-1



118 Alfred Street (Tax Map & Lot# 38-303-1) / from MSRD-2 to MSRD-1

The subject property is .37 acres (approx. 16,117 square feet) in area and the proposed rezoning would include the proposed property and portions of Washington Street and Alfred Street, immediate adjacent to the property as the existing zoning delineation lines are located at the center lines of the right-of-way.

2. PROJECT DATA/INFORMATION:

Property Address: 118 Alfred Street
Tax ID#: Tax Map & Lot# 38-303-1
Current Zoning: MSRD-2
Proposed Zoning: MSRD-1
Lot Size: .37 acres (approx. 16,117 square feet)

Case # 2024.17 – Rezoning Request / 118 Alfred Street (Tax Map & Lot# 38-303-1) / from MSRD-2 to MSRD-1 / Second Reading
Hearing Date: May 15, 2024

3. **REVIEW PROCESS:** The proposed rezoning process requires two (2) public hearings by the Planning Board followed with a recommendation to the City Council for approval or denial. The City Council then reviews, at two (2) regularly scheduled meetings, and votes to deny or approve the proposed rezoning.

4. **STAFF RECOMMENDATION:** This request is being evaluated for Final Rezoning review. Staff is supportive of the proposed rezoning as it seeks to extend the MSRD-1 zoning line to include the subject property, located to the immediate south and west of the current MSRD-1 zoning district boundary.

5. **SAMPLE MOTIONS:**

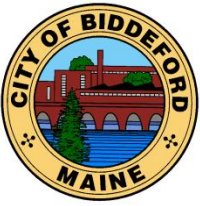
A. Motion to approve Case # 2024.17 Final Rezoning Review for the property located at 118 Alfred Street (Tax Map & Lot# 38-303-1) from the MSRD-2 zoning district to the MSRD-1 zoning district.

B. Motion to Table Case # 2024.17 Final Rezoning Review for the property located at 118 Alfred Street (Tax Map & Lot# 38-303-1) from the MSRD-2 zoning district to the MSRD-1 zoning district, based upon the following reasons:

- a) _____
- b) _____
- c) _____

C. Motion to Deny Case # 2024.17 Final Rezoning Review for the property located at 118 Alfred Street (Tax Map & Lot# 38-303-1) from the MSRD-2 zoning district to the MSRD-1 zoning district, based upon the following reasons:

- a) _____
- b) _____
- c) _____



CITY OF BIDDEFORD

Planning and Development Department

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Planning Board – Staff Report

TO: Chair Patoine and Members of the Biddeford Planning Board

FROM: David C.M. Galbraith, Deputy Director / City Planner

DATE: May 15, 2024

RE: **Zoning Ordinance Text Amendment: Code of Ordinances, Part III: Land Development Regulations, Article XII Floodplain Management Ordinance – FIRST READING**

MEETING DATE: May 15, 2024

Overview:

The City of Biddeford received a Letter of Final Determination (LFD) from the Federal Emergency Management Agency (FEMA) which sets the effective date of the new Digital Flood Insurance Rate Maps (DFIRMs) for York County for July 17, 2024. The LFD marks the beginning of a six-month time period for communities to update their local Floodplain Management Ordinances to reflect any changes since the last ordinance was adopted and to incorporate the new map date. **Biddeford must adopt an updated Floodplain Management Ordinance which references the new map date on or before July 17, 2024, in order to avoid being immediately suspended from the NFIP.**

Suspension from the NFIP will have immediate affects, particularly for those with flood insurance policies in effect. Policies cannot be renewed and new policies cannot be written if the community is suspended. Obviously, the City does not want to see that happen to our citizens / property owners. Participation in the NFIP provides protection to those members of our community who may be affected by flooding. In addition, federal flood insurance is available to those who have federally backed mortgages in the floodplain. Another important benefit is our community's eligibility for disaster funding and low interest loans if/when our county is in a declared disaster area. This is all possible by way of our community's commitment to adopt, administer, and enforce its floodplain ordinance and our commitment to regulate development within Biddeford's flood prone areas.

Attached is a copy of the most current state model Floodplain Management Ordinance that has been customized specifically for the City of Biddeford. The attached Ordinance contains all the changes that have occurred at the federal and state level since our Floodplain Management Ordinance was last adopted / amended. As FEMA has very specific requirements regarding ordinance language, the City is being encouraged to adopt the Ordinance without changes.

Staff Recommendation:

Zoning Ordinance Amendment: Code of Ordinances, Part III: Land Development Regulations, Article XII – Floodplain Management Ordinance to include the new map date and to be in compliance as dictated by the Federal Emergency Management Agency (FEMA) – FIRST READING

Planning Board Meeting: May 15, 2024 – FIRST READING

As outlined above, Biddeford must adopt an updated Floodplain Management Ordinance which references the new map date on or before July 17, 2024, in order to avoid being immediately suspended from the NFIP. Staff is recommending the adoption of the proposed / attached Ordinance in addition to repealing the City's existing Ordinance, immediately following the adoption of the proposed Ordinance. Staff recommends the Planning Board forward a positive recommendation for adoption of the proposed Ordinance to the City Council. Attached for the Board's review is the proposed Amendments to the City's Floodplain Management Ordinance with proposed text highlighted in blue underline and text deletions shown in ~~red strikethrough~~. These changes reflect the adoption of the new standards in their entirety, and deleting our existing ordinance in their entirety, as recommended by the Department of Agriculture, Conservation & Forestry – Maine Floodplain Management Program.

SAMPLE MOTIONS:

- A. Motion to Approve: I motion to APPROVE the proposed Zoning Ordinance Text Amendment: Code of Ordinances, Part III: Land Development Regulations, Article XII Floodplain Management Ordinance – FIRST READING, as written, and upon adoption replace the City's existing Floodplain Management Ordinance.
- B. Motion to Deny I motion to DENY the proposed Zoning Ordinance Text Amendment: Code of Ordinances, Part III: Land Development Regulations, Article XII Floodplain Management Ordinance – FIRST READING, for the following reasons:
- 1) _____.
 - 2) _____.
 - 3) _____.
- C. Motion to Table: I motion to TABLE the proposed the proposed Zoning Ordinance Text Amendment: Code of Ordinances, Part III: Land Development Regulations, Article XII Floodplain Management Ordinance – FIRST READING, for the following reasons:
- 1) _____.
 - 2) _____.
 - 3) _____.

FLOODPLAIN MANAGEMENT ORDINANCE

FOR THE

CITY OF BIDDEFORD, MAINE

ENACTED: _____
Date

EFFECTIVE: _____
Date

CERTIFIED BY: _____
Signature

CERTIFIED BY: _____
Print Name

Title

Affix Seal

City of Biddeford, Code of Ordinances
Part III: Land Development Regulations
Article XII Floodplain Management Ordinance

Planning Board Hearing # 1: May 15, 2024

FLOODPLAIN MANAGEMENT ORDINANCE

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City of Biddeford, Code of Ordinances
Part III: Land Development Regulations
Article XII Floodplain Management Ordinance

Planning Board Hearing # 1: May 15, 2024

ARTICLE I - PURPOSE AND ESTABLISHMENT

Certain areas of the City of Biddeford, Maine are subject to periodic flooding, causing serious damages to properties within these areas. Relief is available in the form of flood insurance as authorized by the National Flood Insurance Act of 1968.

Therefore, the City of Biddeford, Maine has chosen to become a participating community in the National Flood Insurance Program and agrees to comply with the requirements of the National Flood Insurance Act of 1968 (P.L. 90-488, as amended) as delineated in this Floodplain Management Ordinance.

It is the intent of the City of Biddeford, Maine to require the recognition and evaluation of flood hazards in all official actions relating to land use in the floodplain areas having special flood hazards.

The City of Biddeford has the legal authority to adopt land use and control measures to reduce future flood losses pursuant to Title 30-A MRSA, Sections 3001-3007, 4352, 4401-4407, and Title 38 MRSA, Section 440.

The National Flood Insurance Program, established in the aforesaid Act, provides that areas of the City of Biddeford having a special flood hazard be identified by the Federal Emergency Management Agency and that floodplain management measures be applied in such flood hazard areas. This Ordinance establishes a Flood Hazard Development Permit system and review procedure for development activities in the designated flood hazard areas of the City of Biddeford, Maine.

The areas of special flood hazard, Zones A, AE, and VE for the City of Biddeford, York County, Maine, identified by the Federal Emergency Management Agency in a report entitled "Flood Insurance Study – York County, Maine" dated July 17, 2024, with accompanying "Flood Insurance Rate Map" dated July 17, 2024, are hereby adopted by reference and declared to be a part of this Ordinance.

ARTICLE II - PERMIT REQUIRED

The Code Enforcement Officer shall be designated as the local Floodplain Administrator. The Floodplain Administrator shall have the authority to implement the commitment made to administer and enforce the requirements for participation in the National Flood Insurance Program.

Before any construction or other development (as defined in Article XIV), including the placement of manufactured homes, begins within any areas of special flood hazard established in Article I, a Flood Hazard Development Permit shall be obtained from the Code Enforcement Officer, except as provided in Article VII. This permit shall be in addition to any other permits which may be required pursuant to the codes and ordinances of the City of Biddeford, Maine.

ARTICLE III - APPLICATION FOR PERMIT

The application for a Flood Hazard Development Permit shall be submitted to the Code Enforcement Officer and shall include:

- A. The name, address, and phone number of the applicant, owner, and contractor;

City of Biddeford, Code of Ordinances
Part III: Land Development Regulations
Article XII Floodplain Management Ordinance

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- B. An address and a map indicating the location of the construction site;
 - C. A site plan showing locations of existing and/or proposed development, including but not limited to structures, sewage disposal facilities, water supply facilities, areas to be cut and filled, and lot dimensions;
 - D. A statement of the intended use of the structure and/or development;
 - E. A statement of the cost of the development including all materials and labor;
 - F. A statement as to the type of sewage system proposed;
 - G. Specification of dimensions of the proposed structure and/or development;
- [Items H-K.3. apply only to new construction and substantial improvements.]
- H. The elevation in relation to the National Geodetic Vertical Datum (NGVD), North American Vertical Datum (NAVD), or to a locally established datum in Zone A only, of the:
 - 1. base flood at the proposed site of all new or substantially improved structures, which is determined:
 - a. in Zones AE, and VE from data contained in the "Flood Insurance Study - York County, Maine," as described in Article I; or,
 - b. in Zone A:
 - (1) from any base flood elevation data from federal, state, or other technical sources (such as FEMA's Quick-2 model, FEMA 265), including information obtained pursuant to Article VI.M. and IX.D.; or,
 - (2) in the absence of all data described in Article III.H.1.b.(1), information to demonstrate that the structure shall meet the elevation requirement in Article VI.H.2.b., Article VI.I.2.b., or Article VI.J.2.b.
 - 2. highest and lowest grades at the site adjacent to the walls of the proposed building;
 - 3. lowest floor, including basement; and whether or not such structures contain a basement;
 - 4. lowest machinery and equipment servicing the building; and,
 - 5. level, in the case of non-residential structures only, to which the structure will be floodproofed.
 - I. A description of an elevation reference point established on the site of all developments for which elevation standards apply as required in Article VI;
 - J. A written certification by:

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1. a Professional Land Surveyor that the grade elevations shown on the application are accurate; and,
 2. a Professional Land Surveyor, registered professional engineer or architect that the base flood elevation shown on the application is accurate.
- K. The following certifications as required in Article VI by a registered professional engineer or architect:
1. a Floodproofing Certificate (FEMA Form FF-206-FY-22-153, as amended), to verify that the floodproofing methods for any non-residential structures will meet the floodproofing criteria of Article VI.I., and other applicable standards in Article VI;
 2. a V-Zone Certificate to verify that the construction in coastal high hazard areas, Zone VE and Coastal AE Zone, will meet the criteria of Article VI.R.; and other applicable standards in Article VI;
 3. a Hydraulic Openings Certificate to verify that engineered hydraulic openings in foundation walls will meet the standards of Article VI.N.2.a.;
 4. a certified statement that bridges will meet the standards of Article VI.O.;
 5. a certified statement that containment walls will meet the standards of Article VI.P.
- L. A description of the extent to which any water course will be altered or relocated as a result of the proposed development; and,
- M. A statement of construction plans describing in detail how each applicable development standard in Article VI will be met.

ARTICLE IV - APPLICATION FEE AND EXPERT'S FEE

A non-refundable application fee shall be paid to the City through the Code Enforcement Office. This fee is separate from the other required permit and review fees.

- a. The fee for development projects will be \$100.
- b. In cases where projects meet the definition for minor development the fee shall be \$50.

An additional fee may be charged if the Code Enforcement Officer, Planning Board, and/or Board of Appeals needs the assistance of a professional engineer or other expert. The expert's fee shall be paid in full by the applicant within 10 days after the town submits a bill to the applicant. Failure to pay the bill shall constitute a violation of the ordinance and be grounds for the issuance of a stop work order. An expert shall not be hired by the municipality at the expense of an applicant until the applicant has either consented to such hiring in writing or been given an opportunity to be heard on the subject. An applicant who is dissatisfied with a decision to hire expert assistance may appeal that decision to the Board of Appeals.

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ARTICLE V - REVIEW STANDARDS FOR FLOOD HAZARD DEVELOPMENT PERMIT APPLICATIONS

The Code Enforcement Officer shall:

- A. Review all applications for the Flood Hazard Development Permit to assure that proposed developments are reasonably safe from flooding and to determine that all pertinent requirements of Article VI (Development Standards) have been, or will be met;
- B. Utilize, in the review of all Flood Hazard Development Permit applications:
 - 1. the base flood and floodway data contained in the "Flood Insurance Study - York County, Maine," as described in Article I;
 - 2. in special flood hazard areas where base flood elevation and floodway data are not provided, the Code Enforcement Officer shall obtain, review, and reasonably utilize any base flood elevation and floodway data from federal, state, or other technical sources, including information obtained pursuant to Article III.H.1.b.(1); Article VI.M.; and Article IX.D., in order to administer Article VI of this Ordinance; and,
 - 3. when the community establishes a base flood elevation in a Zone A by methods outlined in Article III.H.1.b.(1), the community shall submit that data to the Maine Floodplain Management Program.
- C. Make interpretations of the location of boundaries of special flood hazard areas shown on the maps described in Article I of this Ordinance;
- D. In the review of Flood Hazard Development Permit applications, determine that all necessary permits have been obtained from those federal, state, and local government agencies from which prior approval is required by federal or state law, including but not limited to Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1344;
- E. Notify adjacent municipalities, the Department of Environmental Protection, and the Maine Floodplain Management Program prior to any alteration or relocation of a water course and submit copies of such notifications to the Federal Emergency Management Agency;
- F. If the application satisfies the requirements of this Ordinance, approve the issuance of one of the following Flood Hazard Development Permits, based on the type of development:
 - 1. A two-part Flood Hazard Development Permit for elevated structures. Part I shall authorize the applicant to build a structure to and including the first horizontal floor only above the base flood level. At that time the applicant shall provide the Code Enforcement Officer with an "under construction" Elevation Certificate completed by a Professional Land Surveyor based on the Part I permit construction for verifying compliance with the elevation requirements of Article VI, paragraphs H., I., J., or R. Following review of the Elevation Certificate data, which shall take place within 72 hours of receipt of the application, the Code Enforcement Officer shall issue Part II of the Flood Hazard Development Permit. Part II shall authorize the applicant to complete the construction project; or,

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2. A Flood Hazard Development Permit for Floodproofing of Non-Residential Structures that are new construction or substantially improved non-residential structures that are not being elevated but that meet the floodproofing standards of Article VI.I.1. The application for this permit shall include a Floodproofing Certificate signed by a registered professional engineer or architect; or,
3. A Flood Hazard Development Permit for Minor Development for all development that is not new construction or a substantial improvement, such as repairs, maintenance, renovations, or additions, whose value is less than 50% of the market value of the structure. Minor development also includes but is not limited to: accessory structures as provided for in Article VI.L., mining, dredging, filling, grading, paving, excavation, drilling operations, storage of equipment or materials, deposition or extraction of materials, public or private sewage disposal systems or water supply facilities that do not involve structures; and non-structural projects such as bridges, dams, towers, fencing, pipelines, wharves, and piers.

For development that requires review and approval as a Conditional Use, as provided for in this Ordinance, the Flood Hazard Development Permit Application shall be acted upon by the Planning Board as required in Article VII.

- G. Maintain, as a permanent record, copies of all Flood Hazard Development Permit Applications, corresponding Permits issued, and data relevant thereto, including reports of the Board of Appeals on variances granted under the provisions of Article X of this Ordinance, and copies of Elevation Certificates, Floodproofing Certificates, Certificates of Compliance, and certifications of design standards required under the provisions of Articles III, VI, and VIII of this Ordinance.

ARTICLE VI - DEVELOPMENT STANDARDS

All developments in areas of special flood hazard shall meet the following applicable standards:

A. All Development - All development shall:

1. be designed or modified and adequately anchored to prevent flotation (excluding piers and docks), collapse, or lateral movement of the development resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;
2. use construction materials that are resistant to flood damage;
3. use construction methods and practices that will minimize flood damage; and,
4. use electrical, heating, ventilation, plumbing, and air conditioning equipment, and other service facilities that are designed and/or located to prevent water from entering or accumulating within the components during flooding conditions.

- B. Water Supply** - All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems.

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- C. Sanitary Sewage Systems** - All new and replacement sanitary sewage systems shall be designed and located to minimize or eliminate infiltration of flood waters into the system and discharges from the system into flood waters.
- D. On Site Waste Disposal Systems** - On site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during floods.
- E. Watercourse Carrying Capacity** - All development associated with altered or relocated portions of a watercourse shall be constructed and maintained in such a manner that no reduction occurs in the flood carrying capacity of the watercourse.
- F. Utilities** - New construction or substantial improvement of any structure (including manufactured homes) located within:
1. Zones A and AE shall have the bottom of all electrical, heating, plumbing, ventilation and air conditioning equipment, permanent fixtures and components, HVAC ductwork and duct systems, and any other utility service equipment, facilities, machinery, or connections servicing a structure, elevated to at least one foot above the base flood elevation.
 2. Zone VE shall meet the requirements of Article VI.R.2.
- G. Physical Changes to the Natural Landscape** - Certain development projects, including but not limited to, retaining walls, sea walls, levees, berms, and rip rap, can cause physical changes that affect flooding conditions.
1. All development projects in Zones AE and VE that cause physical changes to the natural landscape shall be reviewed by a Professional Engineer to determine whether or not the project changes the base flood elevation, zone, and/or the flood hazard boundary line.
 - a. If the Professional Engineer determines, through the use of engineering judgement, that the project would not necessitate a Letter of Map Revision (LOMR), a certified statement shall be provided.
 - b. If the Professional Engineer determines that the project may cause a change, a hydrologic and hydraulic analysis that meets current FEMA standards shall be performed.
 2. If the hydrologic and hydraulic analysis performed indicates a change to the base flood elevation, zone, and/or the flood hazard boundary line, the applicant may submit a Conditional Letter of Map Revision (C-LOMR) request to the Federal Emergency Management Agency for assurance that the as-built project will result in a change to the Flood Insurance Rate Map. Once the development is completed, a request for a Letter of Map Revision (LOMR) shall be initiated.
 3. If the hydrologic and hydraulic analysis performed show a change to the base flood elevation, zone, and/or the flood hazard boundary line, as soon as practicable, but no later than 6 months after the completion of the project, the applicant shall submit the technical data to FEMA in the form of a Letter of Map Revision request.

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H. **Residential** - New construction or substantial improvement of any residential structure located within:

1. Zones AE shall have the lowest floor (including basement) elevated to at least one foot above the base flood elevation.
2. Zone A shall have the lowest floor (including basement) elevated:
 - a. to at least one foot above the base flood elevation utilizing information obtained pursuant to Article III.H.1.b.(1); Article V.B.; or Article IX.D., or;
 - b. in the absence of all data described in Article VI.H.2.a., to at least two feet above the highest adjacent grade to the structure.
3. Zone VE and Coastal AE Zone (as defined) shall meet the requirements of Article VI.R.

I. **Non-Residential** - New construction or substantial improvement of any non-residential structure located within:

1. Zones AE shall have the lowest floor (including basement) elevated to at least one foot above the base flood elevation, or together with attendant utility and sanitary facilities shall:
 - a. be floodproofed to at least one foot above the base flood elevation so that below that elevation the structure is watertight with walls substantially impermeable to the passage of water;
 - b. have structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy; and,
 - c. be certified by a registered professional engineer or architect that the floodproofing design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of this section. Such certification shall be provided with the application for a Flood Hazard Development Permit, as required by Article III.K., and shall include a record of the elevation above mean sea level to which the structure is floodproofed.
2. Zone A shall have the lowest floor (including basement) elevated:
 - a. to at least one foot above the base flood elevation utilizing information obtained pursuant to Article III.H.1.b.(1); Article V.B.; or Article IX.D., or;
 - b. in the absence of all data described in Article VI.I.2.a., to at least two feet above the highest adjacent grade to the structure; or,
 - c. together with attendant utility and sanitary facilities, be floodproofed to one foot above the elevation established in Article VI.I.2.a. or b. and meet the floodproofing standards of Article VI.I.1.a., b., and c.

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5. Zone VE and Coastal AE Zone (as defined) shall meet the requirements of Article VI.R.

J. **Manufactured Homes** - New or substantially improved manufactured homes located within:

1. Zone AE shall:

- a. be elevated such that the lowest floor (including basement) of the manufactured home is at least one foot above the base flood elevation;
- b. be on a permanent foundation, which may be poured masonry slab or foundation walls, with hydraulic openings, or may be reinforced piers or block supports, any of which support the manufactured home so that no weight is supported by its wheels and axles; and,
- c. be securely anchored to an adequately anchored foundation system to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to:
 - (1) over-the-top ties anchored to the ground at the four corners of the manufactured home, plus two additional ties per side at intermediate points (manufactured homes less than 50 feet long require one additional tie per side); or by,
 - (2) frame ties at each corner of the home, plus five additional ties along each side at intermediate points (manufactured homes less than 50 feet long require four additional ties per side).
 - (3) All components of the anchoring system described in Article VI.J.1.c.(1) & (2) shall be capable of carrying a force of 4800 pounds.

2. Zone A shall:

- a. be elevated on a permanent foundation, as described in Article VI.J.1.b., such that the lowest floor (including basement) of the manufactured home is at least one foot above the base flood elevation utilizing information obtained pursuant to Article III.H.1.b.(1); Article V.B.; or Article IX.D.; or,
- b. in the absence of all data described in Article VI.J.2.a., to at least two feet above the highest adjacent grade to the structure; and,
- c. meet the anchoring requirements of VI.J.1.c.

5. Zone VE and Coastal AE Zone (as defined) shall meet the requirements of Article VI.R.

K. **Recreational Vehicles** - Recreational Vehicles located within:

1. Zones A and AE shall either:

- a. be on the site for fewer than 180 consecutive days; and,

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b. be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions; or,

c. be permitted in accordance with the elevation and anchoring requirements for "manufactured homes" in Article VI.J.1.

2. Zone VE and Coastal AE Zone (as defined) shall meet the requirements of either Article VI.K.1.a. and b., or Article VI.R.

L. **Accessory Structures** - New construction or substantial improvement of Accessory Structures, as defined in Article XIV, shall be exempt from the elevation criteria required in Article VI.H. & I. above, if all other requirements of Article VI and all the following requirements are met.

1. Accessory Structures located in Zones A and AE shall:

- a. meet the requirements of Article VI.A.1. through 4., as applicable;
- b. be limited in size to a one-story two car garage;
- c. have unfinished interiors and not be used for human habitation;
- d. have only ground fault interrupt electrical outlets. The electric service disconnect shall be located above the base flood elevation and, when possible, outside the Special Flood Hazard Area;
- e. be located outside the floodway;
- f. when possible be constructed and placed on the building site so as to offer the minimum resistance to the flow of floodwaters and be placed further from the source of flooding than is the primary structure;
- g. have hydraulic openings, as specified in Article VI.N.2., in at least two different walls of the accessory structure; and
- h. be located outside the Coastal AE Zone.

2. Accessory Structures in Zone VE and Coastal A Zones shall meet the requirements of Article VI.R.

M. Floodways -

1. In Zone AE riverine areas, encroachments, including fill, new construction, substantial improvement, and other development shall not be permitted within a regulatory floodway which is designated on the community's Flood Insurance Rate Map unless a technical evaluation certified by a registered professional engineer is provided demonstrating that such

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encroachments will not result in any increase in flood levels within the community during the occurrence of the base flood discharge.

2. In Zones A and AE riverine areas, for which no regulatory floodway is designated, encroachments, including fill, new construction, substantial improvement, and other development shall not be permitted in the floodway as determined in Article VI.M.3. unless a technical evaluation certified by a registered professional engineer is provided demonstrating that the cumulative effect of the proposed development, when combined with all other existing development and anticipated development:

a. will not increase the water surface elevation of the base flood more than one foot at any point within the community; and,

b. is consistent with the technical criteria contained in FEMA's guidelines and standards for flood risk analysis and mapping.

3. In Zones A and AE riverine areas, for which no regulatory floodway is designated, the regulatory floodway is determined to be the channel of the river or other water course and the adjacent land areas to a distance of one-half the width of the floodplain as measured from the normal high water mark to the upland limit of the floodplain.

N. Hydraulic Openings/Flood Vents - New construction or substantial improvement of any structure in Zones A and AE that meets the development standards of Article VI, including the elevation requirements of Article VI, paragraphs H., I., or J. and is elevated on posts, columns, piers, piles, or crawl spaces may be enclosed below the base flood elevation requirements provided all the following criteria are met or exceeded:

1. Enclosed areas are not "basements" as defined in Article XIV;

2. Enclosed areas shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of flood water. Designs for meeting this requirement must either:

a. be engineered and certified by a registered professional engineer or architect; or,

b. meet or exceed the following minimum criteria:

(1) a minimum of two openings having a total net area of not less than one square inch for every square foot of the enclosed area;

(2) the bottom of all openings shall be below the base flood elevation and no higher than one foot above the lowest grade; and,

(3) openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the entry and exit of flood waters automatically without any external influence or control such as human intervention, including the use of electrical and other non-automatic mechanical means;

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3. The enclosed area shall not be used for human habitation; and,

4. The enclosed areas are usable solely for building access, parking of vehicles, or storage.

O. **Bridges** - New construction or substantial improvement of any bridge in Zones A, AE, and VE shall be designed such that:

1. when possible, the lowest horizontal member (excluding the pilings or columns) is elevated to at least one foot above the base flood elevation; and,

2. a registered professional engineer shall certify that:

a. the structural design and methods of construction shall meet the elevation requirements of this section and the floodway standards of Article VI.M.; and,

b. the foundation and superstructure attached thereto are designed to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all structural components. Water loading values used shall be those associated with the base flood.

P. **Containment Walls** - New construction or substantial improvement of any containment wall located within:

1. Zones A, AE, and VE shall:

a. have the containment wall elevated to at least one foot above the base flood elevation;

b. have structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy; and,

c. be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of this section. Such certification shall be provided with the application for a Flood Hazard Development Permit, as required by Article III.K.

Q. **Wharves, Piers, and Docks** - New construction or substantial improvement of wharves, piers, and docks are permitted in and over water and seaward of the mean high tide if the following requirements are met:

1. in Zones A and AE, wharves, piers, and docks shall comply with all applicable local, state, and federal regulations; or,

2. in Zone VE, wharves, piers, and docks shall have a registered professional engineer develop or review the structural design, specifications, and plans for the construction.

R. **Coastal Floodplains** -

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1. New construction located within Zones AE and VE shall be located landward of the reach of mean high tide except as provided in Article VI.R.7.
2. New construction or substantial improvement of any structure located within Zone VE or Coastal AE Zone shall have the bottom of all electrical, heating, plumbing, ventilation and air conditioning equipment, permanent fixtures and components, HVAC ductwork and duct systems, and any other utility service equipment, facilities, machinery, or connections servicing a structure, elevated to at least one foot above the base flood elevation. Systems, fixtures, equipment, and components shall not be mounted on or penetrate through walls intended to break away under flood loads.
3. New construction or substantial improvement of any structure located within Zone VE and Coastal AE Zones (as defined) shall:
 - a. be elevated on posts or columns such that:
 - (1) the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to at least one foot above the base flood elevation;
 - (2) the pile or column foundation and the elevated portion of the structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components; and,
 - (3) water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable state and local building standards.
 - b. have the space below the lowest floor:
 - (1) free of obstructions; or,
 - (2) constructed with open wood lattice-work, or insect screening intended to collapse under wind and water without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting piles or columns; or,
 - (3) constructed with non-supporting breakaway walls that have a design safe loading resistance of not less than 10 or more than 20 pounds per square foot.
 - c. require a registered professional engineer or architect to:
 - (1) develop or review the structural design, specifications, and plans for the construction, which must meet or exceed the technical criteria contained in the *Coastal Construction Manual*, (FEMA-55); and,
 - (2) certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the criteria of Article VI.R.3.

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4. The use of fill for structural support in Zone VE and Coastal AE Zones is prohibited.
5. Human alteration of sand dunes within Zone VE and Coastal AE Zones is prohibited unless it can be demonstrated that such alterations will not increase potential flood damage.
6. The area below the lowest floor shall be used solely for parking vehicles, building access, and storage.
7. Conditional Use - Lobster sheds and fishing sheds may be located seaward of mean high tide and shall be exempt from the elevation requirement in Article VI.I. only if permitted as a Conditional Use following review and approval by the Planning Board, as provided in Article VII, and if all the following requirements and those of Article VI.A., VI.M., and VI.N. are met:
 - a. The conditional use shall be limited to low value structures such as metal or wood sheds 200 square feet or less and shall not exceed more than one story.
 - b. The structure shall be securely anchored to the wharf or pier to resist flotation, collapse, and lateral movement due to the effect of wind and water loads acting simultaneously on all building components.
 - c. The structure will not adversely increase wave or debris impact forces affecting nearby buildings.
 - d. The structure shall have unfinished interiors and shall not be used for human habitation.
 - e. Any mechanical, utility equipment, and fuel storage tanks must be anchored and either elevated or floodproofed to at least one foot above the base flood elevation.
 - f. All electrical outlets shall be ground fault interrupt type. The electrical service disconnect shall be located on shore above the base flood elevation and, when possible, outside the Special Flood Hazard Area.

ARTICLE VII - CONDITIONAL USE REVIEW

The Planning Board shall hear and decide upon applications for conditional uses provided for in this Ordinance. The Planning Board shall hear and approve, approve with conditions, or disapprove all applications for conditional uses. An applicant informed by the Code Enforcement Officer that a Conditional Use Permit is required shall file an application for the permit with the Planning Board.

A. Review Procedure for a Conditional Use Flood Hazard Development Permit

1. The Flood Hazard Development Permit Application with additional information attached addressing how each of the conditional use criteria specified in the Ordinance will be satisfied may serve as the permit application for the Conditional Use Permit.
2. Before deciding any application, the Planning Board shall hold a public hearing on the application within thirty days of their receipt of the application.

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3. If the Planning Board finds that the application satisfies all relevant requirements of the ordinance, the Planning Board must approve the application or approve with conditions within 45 days of the date of the public hearing.
4. A Conditional Use Permit issued under the provisions of this Ordinance shall expire if the work or change involved is not commenced within 180 days of the issuance of the permit by the Planning Board.
5. The applicant shall be notified by the Planning Board in writing over the signature of the Chairman of the Planning Board that flood insurance is not available for structures located entirely over water or seaward of mean high tide.

B. Expansion of Conditional Uses

1. No existing building or use of premises may be expanded or enlarged without a permit issued under this section if that building or use was established or constructed under a previously issued Conditional Use Permit or if it is a building or use which would require a Conditional Use Permit if being newly-established or constructed under this Ordinance.

ARTICLE VIII - CERTIFICATE OF COMPLIANCE

No land in a special flood hazard area shall be occupied or used and no structure which is constructed or substantially improved shall be occupied until a Certificate of Compliance is issued by the Code Enforcement Officer subject to the following provisions:

A. For New Construction or Substantial Improvement of any elevated structure the applicant shall submit to the Code Enforcement Officer:

1. an Elevation Certificate completed by a Professional Land Surveyor for compliance with Article VI, paragraphs H., I., J., or R.; and,
2. for structures in Zone VE and Coastal AE Zone (as defined), certification by a registered professional engineer or architect that the design and methods of construction used are in compliance with Article VI.R.3.

B. The applicant shall submit written notification to the Code Enforcement Officer that the development is complete and complies with the provisions of this ordinance.

C. Within 10 working days, the Code Enforcement Officer shall:

1. review the required certificate(s) and the applicant's written notification; and,
2. upon determination that the development conforms to the provisions of this ordinance, shall issue a Certificate of Compliance.

ARTICLE IX - REVIEW OF SUBDIVISION AND DEVELOPMENT PROPOSALS

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The Planning Board shall, when reviewing subdivisions and other proposed developments that require review under other federal law, state law, local ordinances or regulations, and all projects on 5 or more disturbed acres, or in the case of manufactured home parks divided into two or more lots, assure that:

- A. All such proposals are consistent with the need to minimize flood damage.
- B. All public utilities and facilities, such as sewer, gas, electrical, and water systems are located and constructed to minimize or eliminate flood damages.
- C. Adequate drainage is provided so as to reduce exposure to flood hazards.
- D. All proposals include base flood elevations, flood boundaries, and, in a riverine floodplain, floodway data. These determinations shall be based on engineering practices recognized by the Federal Emergency Management Agency.
- E. Any proposed development plan must include a condition of plan approval requiring that structures on any lot in the development having any portion of its land within a Special Flood Hazard Area are to be constructed in accordance with Article VI of this ordinance. Such requirement will be included in any deed, lease, purchase and sale agreement, or document transferring or expressing an intent to transfer any interest in real estate or structure, including but not limited to a time-share interest. The condition shall clearly articulate that the municipality may enforce any violation of the construction requirement and that fact shall also be included in the deed or any other document previously described. The construction requirement shall also be clearly stated on any map, plat, or plan to be signed by the Planning Board or local reviewing authority as part of the approval process.

ARTICLE X - APPEALS AND VARIANCES

The Board of Appeals of the City of Biddeford may, upon written application of an aggrieved party, hear and decide appeals where it is alleged that there is an error in any order, requirement, decision, or determination made by, or failure to act by, the Code Enforcement Officer or Planning Board in the administration or enforcement of the provisions of this Ordinance.

The Board of Appeals may grant a variance from the requirements of this Ordinance consistent with state law and the following criteria:

- A. Variances shall not be granted within any designated regulatory floodway if any increase in flood levels during the base flood discharge would result.
- B. Variances shall be granted only upon:
 - 1. a showing of good and sufficient cause; and,
 - 2. a determination that should a flood comparable to the base flood occur, the granting of a variance will not result in increased flood heights, additional threats to public safety, public expense, or create nuisances, cause fraud or victimization of the public, or conflict with existing local laws or ordinances; and,

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- 3. a showing that the issuance of the variance will not conflict with other state, federal, or local laws or ordinances; and,
- 4. a determination that failure to grant the variance would result in "undue hardship," which in this sub-section means:
 - a. that the land in question cannot yield a reasonable return unless a variance is granted; and,
 - b. that the need for a variance is due to the unique circumstances of the property and not to the general conditions in the neighborhood; and,
 - c. that the granting of a variance will not alter the essential character of the locality; and,
 - d. that the hardship is not the result of action taken by the applicant or a prior owner.
- C. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief, and the Board of Appeals may impose such conditions to a variance as is deemed necessary.
- D. Variances may be issued for new construction, substantial improvements, or other development for the conduct of a functionally dependent use provided that:
 - 1. the criteria of Article X.A. through C. and Article VI.M. are met; and,
 - 2. the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.
- E. Variances may be issued for the repair, reconstruction, rehabilitation, or restoration of Historic Structures upon the determination that:
 - 1. the development meets the criteria of Article X.A. through C.; and,
 - 2. the proposed repair, reconstruction, rehabilitation, or restoration will not preclude the structure's continued designation as a Historic Structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
- F. Variances may be issued for new construction and substantial improvement of Agricultural Structures being used for the conduct of agricultural uses provided that:
 - 1. the development meets the criteria of Article X.A. through C.; and,
 - 2. the development meets the criteria of Article VI.M. and Article VI.N.
- G. Any applicant who meets the criteria of Article X.A. through C. and Article X.D., E., or F. shall be notified by the Board of Appeals in writing over the signature of the Chairman of the Board of Appeals that:

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1. the issuance of a variance to construct a structure below the base flood level will result in greatly increased premium rates for flood insurance up to amounts as high as \$25 per \$100 of insurance coverage; and,
2. such construction below the base flood level increases risks to life and property; and,
3. the applicant agrees in writing that the applicant is fully aware of all the risks inherent in the use of land subject to flooding, assumes those risks, and agrees to indemnify and defend the municipality against any claims filed against it that are related to the applicant's decision to use land located in a floodplain and that the applicant individually releases the municipality from any claims the applicant may have against the municipality that are related to the use of land located in a floodplain.

H. Appeal Procedure for Administrative and Variance Appeals

1. An administrative or variance appeal may be taken to the Board of Appeals by an aggrieved party within thirty days after receipt of a written decision of the Code Enforcement Officer or Planning Board.
2. Upon being notified of an appeal, the Code Enforcement Officer or Planning Board, as appropriate, shall transmit to the Board of Appeals all of the documents constituting the record of the decision appealed from.
3. The Board of Appeals shall hold a public hearing on the appeal within thirty-five days of its receipt of an appeal request.
4. The person filing the appeal shall have the burden of proof.
5. The Board of Appeals shall decide all appeals within thirty-five days after the close of the hearing and shall issue a written decision on all appeals.
6. The Board of Appeals shall submit to the Code Enforcement Officer a report of all variance actions, including justification for the granting of the variance and an authorization for the Code Enforcement Officer to issue a Flood Hazard Development Permit, which includes any conditions to be attached to said permit.
7. Any aggrieved party who participated as a party during the proceedings before the Board of Appeals may take an appeal to Superior Court in accordance with State laws within forty-five days from the date of any decision of the Board of Appeals.

ARTICLE XI - ENFORCEMENT AND PENALTIES

- A. It shall be the duty of the Code Enforcement Officer to enforce the provisions of this Ordinance pursuant to Title 30-A MRSA § 4452.
- B. The penalties contained in Title 30-A MRSA § 4452 shall apply to any violation of this Ordinance.

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C. In addition to other actions, the Code Enforcement Officer, upon identifying a violation, may submit a declaration to the Administrator of the Federal Insurance Administration requesting a flood insurance denial. The valid declaration shall consist of:

1. the name of the property owner and address or legal description of the property sufficient to confirm its identity or location;
2. a clear and unequivocal declaration that the property is in violation of a cited State or local law, regulation, or ordinance;
3. a clear statement that the public body making the declaration has authority to do so and a citation to that authority;
4. evidence that the property owner has been provided notice of the violation and the prospective denial of insurance; and,
5. a clear statement that the declaration is being submitted pursuant to Section 1316 of the National Flood Insurance Act of 1968, as amended.

ARTICLE XII - VALIDITY AND SEVERABILITY

If any section or provision of this Ordinance is declared by the courts to be invalid, such decision shall not invalidate any other section or provision of this Ordinance.

ARTICLE XIII - CONFLICT WITH OTHER ORDINANCES

This Ordinance shall not in any way impair or remove the necessity of compliance with any other applicable rule, ordinance, regulation, bylaw, permit, or provision of law. Where this Ordinance imposes a greater restriction upon the use of land, buildings, or structures, the provisions of this Ordinance shall control.

ARTICLE XIV - DEFINITIONS

Unless specifically defined below, words and phrases used in this Ordinance shall have the same meaning as they have at common law, and to give this Ordinance its most reasonable application. Words used in the present tense include the future, the singular number includes the plural, and the plural number includes the singular. The word "may" is permissive; "shall" is mandatory and not discretionary.

Accessory Structure - a structure which is on the same parcel of property as a principal structure and the use of which is incidental to the use of the principal structure.

Adjacent Grade - the natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

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Agricultural Structure - structures that are used exclusively for agricultural purposes or uses in connection with the production, harvesting, storage, raising, or drying of agricultural commodities and livestock. Structures that house tools or equipment used in connection with these purposes or uses are also considered to have agricultural purposes or uses.

Area of Special Flood Hazard - land in the floodplain having a one percent or greater chance of flooding in any given year, as specifically identified in the Flood Insurance Study cited in Article I of this Ordinance.

Base Flood - a flood having a one percent chance of being equaled or exceeded in any given year, commonly called the 100-year flood.

Basement - any area of a building that includes a floor that is subgrade (below ground level) on all sides.

Breakaway Wall - a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

Building - see **Structure**.

Certificate of Compliance - a document signed by the Code Enforcement Officer stating that a structure is in compliance with all of the provisions of this Ordinance.

Coastal AE Zone - The portion of the Coastal High Hazard Area with wave heights between 1.5 feet and 3.0 feet and bounded by a line labeled the "Limit of Moderate Wave Action" (LiMWA) on a Flood Insurance Rate Map (FIRM). VE Zone floodplain construction standards are applied to development, new construction, and substantial improvements in the Coastal AE Zone.

Coastal High Hazard Area - An area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. Coastal High Hazard Areas are designated as Zone VE and Zone AE bounded by a line labeled "Limit of Moderate Wave Action" (LiMWA) on a Flood Insurance Rate Map (FIRM).

Code Enforcement Officer - a person certified under Title 30-A MRSA, Section 4451 (including exceptions in Section 4451, paragraph 1) and employed by a municipality to enforce all applicable comprehensive planning and land use laws.

Conditional Use - a use that, because of its potential impact on surrounding areas and structures, is permitted only upon review and approval by the Planning Board pursuant to Article VII.

Containment Wall - a wall surrounding all sides of an above ground tank to contain any spills or leaks.

Development - any manmade change to improved or unimproved real estate. This includes, but is not limited to, buildings or other structures; mining, dredging, filling, grading, paving, excavation, drilling operations or storage of equipment or materials; and the storage, deposition, or extraction of materials.

Elevated Building - a non-basement building that is:

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- a. built, in the case of a building in Zones A or AE, so that the top of the elevated floor, or in the case of a building in Zone VE or Coastal AE Zone, to have the bottom of the lowest horizontal structural member of the elevated floor, elevated above the ground level by means of pilings, columns, posts, or piers; and,
- b. adequately anchored to not impair the structural integrity of the building during a flood of up to one foot above the magnitude of the base flood.

In the case of Zones A or AE, **Elevated Building** also includes a building elevated by means of fill or solid foundation perimeter walls with hydraulic openings sufficient to facilitate the unimpeded movement of flood waters, as required in Article VI.N. In the case of Zone VE and Coastal AE Zone, **Elevated Building** also includes a building otherwise meeting the definition of elevated building, even though the lower area is enclosed by means of breakaway walls, if the breakaway walls meet the standards of Article VI.R.3.b.(3).

Elevation Certificate - an official form (FEMA Form FF-206-FY-22-152, as amended) that is used to verify compliance with the floodplain management regulations of the National Flood Insurance Program.

Existing Manufactured Home Park or Subdivision - a manufactured home park or subdivision that was recorded in the deed registry prior to the adoption date of the community's first floodplain management regulations.

Flood or Flooding -

- a. A general and temporary condition of partial or complete inundation of normally dry land areas from:
 - 1. The overflow of inland or tidal waters.
 - 2. The unusual and rapid accumulation or runoff of surface waters from any source.
- b. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph a.1. of this definition.

Flood Elevation Study - an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations.

Flood Insurance Rate Map (FIRM) - an official map of a community, on which the Federal Insurance Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.

Flood Insurance Study - see **Flood Elevation Study**.

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Floodplain or Floodprone Area - any land area susceptible to being inundated by water from any source (see **Flood or Flooding**).

Floodplain Management - the operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works, and floodplain management regulations.

Floodplain Management Regulations - zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a floodplain ordinance, grading ordinance, and erosion control ordinance), and other applications of police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

Floodproofing - any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures, and contents.

Floodway - see **Regulatory Floodway**.

Floodway Encroachment Lines - the lines marking the limits of floodways on federal, state, and local floodplain maps.

Freeboard - a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. Freeboard tends to compensate for the many unknown factors, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed, which could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions.

Functionally Dependent Use - a use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage or related manufacturing facilities.

Historic Structure - any structure that is:

- a. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- b. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary of the Interior to qualify as a registered historic district;
- c. Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or,
- d. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:

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1. By an approved state program as determined by the Secretary of the Interior, or,
2. Directly by the Secretary of the Interior in states without approved programs.

Limit of Moderate Wave Action (LiMWA) - The landward limit of the 1.5 foot breaking wave within a Coastal AE Zone. These areas are bounded by a line labeled "Limit of Moderate Wave Action" (LiMWA) on a Flood Insurance Rate Map (FIRM). The LiMWA line delineates that portion of the Special Flood Hazard Area (SFHA) landward of a VE zone in which the principal sources of flooding are astronomical high tides, storm surges, or tsunamis, not riverine sources. These areas may be subject to wave effects, velocity flows, erosion, scour, or combinations of these forces. The floodplain development and construction standards for VE Zones will be applied in the Coastal AE Zone.

Locally Established Datum - for purposes of this ordinance, an elevation established for a specific site to which all other elevations at the site are referenced. This elevation is generally not referenced to the National Geodetic Vertical Datum (NGVD), North American Vertical Datum (NAVD), or any other established datum and is used in areas where Mean Sea Level data is too far from a specific site to be practically used.

Lowest Floor - the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements described in Article VI.N. of this Ordinance.

Manufactured Home - a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes the term manufactured home also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days.

Manufactured Home Park or Subdivision - a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

Mean Sea Level - for the purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of 1929, North American Vertical Datum (NAVD), or other datum, to which base flood elevations shown on a community's Flood Insurance Rate Map are referenced.

Minor Development - all development that is not new construction or a substantial improvement, such as repairs, maintenance, renovations, or additions, whose value is less than 50% of the market value of the structure. It also includes but is not limited to: accessory structures as provided for in Article VI.L., mining, dredging, filling, grading, paving, excavation, drilling operations, storage of equipment or materials, deposition or extraction of materials, public or private sewage disposal systems or water supply facilities that do not involve structures; and non-structural projects such as bridges, dams, towers, fencing, pipelines, wharves, and piers.

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National Geodetic Vertical Datum (NGVD) - the national vertical datum, a standard established in 1929, which is used by the National Flood Insurance Program (NFIP). NGVD is based upon mean sea level in 1929 and has been called "1929 Mean Sea Level" (MSL).

New Construction - structures for which the "start of construction" commenced on or after the effective date of the initial floodplain management regulations adopted by a community and includes any subsequent improvements to such structures.

North American Vertical Datum (NAVD) - the national datum whose standard was established in 1988, which is the new vertical datum used by the National Flood Insurance Program (NFIP) for all new Flood Insurance Rate Maps. NAVD is based upon the vertical data used by other North American countries such as Canada and Mexico and was established to replace NGVD because of constant movement of the earth's crust, glacial rebound and subsidence, and the increasing use of satellite technology.

100-year flood - see **Base Flood**.

Recreational Vehicle - a vehicle that is:

- a. built on a single chassis;
- b. 400 square feet or less when measured at the largest horizontal projection, not including slideouts;
- c. designed to be self-propelled or permanently towable by a motor vehicle; and,
- d. designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Regulatory Floodway -

- a. the channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height, and,
- b. when not designated on the community's Flood Insurance Rate Map, it is considered to be the channel of a river or other water course and the adjacent land areas to a distance of one-half the width of the floodplain, as measured from the normal high water mark to the upland limit of the floodplain.

Riverine - relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

Special Flood Hazard Area - see **Area of Special Flood Hazard**.

Start of Construction - the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, substantial improvement, or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a

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manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, or modification of any construction element, whether or not that alteration affects the external dimensions of the building.

Structure - for floodplain management purposes, a walled and roofed building. A gas or liquid storage tank that is principally above ground is also a structure.

Substantial Damage - damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damage condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Substantial Improvement - any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred substantial damage, regardless of the actual repair work performed. The term does not, however, include either:

- a. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or,
- b. Any alteration of a Historic Structure, provided that the alteration will not preclude the structure's continued designation as a historic structure, and a variance is obtained from the Board of Appeals.

Variance - a grant of relief by a community from the terms of a floodplain management regulation.

Violation - the failure of a structure or development to comply with a community's floodplain management regulations.

ARTICLE XV - ABROGATION

This ordinance repeals and replaces any municipal ordinance previously enacted to comply with the National Flood Insurance Act of 1968 (P.L. 90-488, as amended).

ARTICLE XVI - DISCLAIMER OF LIABILITY

The degree of flood protection required by the ordinance is considered reasonable but does not imply total flood protection.

Section 1 Purpose and establishment.

[Ord. No. 2006.26,^[1] 5-2-2006]

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~~Certain areas of the City of Biddeford, Maine are subject to periodic flooding, causing serious damages to properties within these areas. Relief is available in the form of flood insurance as authorized by the National Flood Insurance Act of 1968.~~

~~Therefore, the City of Biddeford, Maine has chosen to become a participating community in the National Flood Insurance Program, and agrees to comply with the requirements of the National Flood Insurance Act of 1968 (P.L. 90-488, as amended) as delineated in this Floodplain Management Ordinance.~~

~~It is the intent of the City of Biddeford, Maine to require the recognition and evaluation of flood hazards in all official actions relating to land use in the floodplain areas having special flood hazards.~~

~~The City of Biddeford has the legal authority to adopt land use and control measures to reduce future flood losses pursuant to Title 30 A M.R.S.A. §§ 3001 through 3007, 4352 and 4401 through 4407, and Title 38 M.R.S.A. § 440.~~

~~The National Flood Insurance Program, established in the aforesaid Act, provides that areas of the City of Biddeford having a special flood hazard be identified by the Federal Emergency Management Agency and that floodplain management measures be applied in such flood hazard areas. This ordinance establishes a flood hazard development permit system and review procedure for development activities in the designated flood hazard areas of the City of Biddeford, Maine.~~

~~The areas of special flood hazard, Zones A, A1—30, AO, and V1—30, are identified by the Federal Emergency Management Agency in a report entitled "Flood Insurance Study City of Biddeford, Maine, York County," dated November 15, 1983 with accompanying "Flood Insurance Rate Map" dated May 15, 1984, and "Flood Boundary and Floodway Map" dated May 15, 1984, which are hereby adopted by reference and declared to be a part of this ordinance.~~

~~[1] Editor's Note: This ordinance amended former Art. XII, Floodplain Management Ordinance, in its entirety. Said Art. XII was originally adopted as Ord. of 6-2-198(3), Arts. I through XIV.~~

Section 2 Permit required.

~~[Ord. No. 2006.26, 5-2-2006]~~

~~Before any construction or other development (as defined in Section 14), including the placement of manufactured homes, begins within any areas of special flood hazard established in Section 1, a flood hazard development permit shall be obtained from the Code Enforcement~~

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~~Officer except as provided in Section 7. This permit shall be in addition to any other building permits which may be required pursuant to the codes and ordinances of the City of Biddeford, Maine.~~

~~Section 3 Application for permit.~~

~~{Ord. No. 2006.26, 5-2-2006}~~

~~The application for a flood hazard development permit shall be submitted to the Code Enforcement Officer and shall include:~~

- ~~A. The name, address and phone number of the applicant, owner, and contractor;~~
- ~~B. An address and a map indicating the location of the construction site;~~
- ~~C. A site plan showing location of existing and/or proposed development, including but not limited to structures, sewage disposal facilities, water supply facilities, areas to be cut and filled, and lot dimensions;~~
- ~~D. A statement of the intended use of the structure and/or development;~~
- ~~E. A statement of the cost of the development including all materials and labor;~~
- ~~F. A statement as to the type of sewage system proposed;~~
- ~~G. Specification of dimensions of the proposed structure and/or development;
{Items H—K3 apply only to new construction and substantial improvements.}~~
- ~~H. The elevation in relation to the National Geodetic Vertical Datum (NGVD), or to a locally established datum in Zone A only, of the:~~
 - ~~1. Base flood at the proposed site of all new or substantially improved structures, which is determined:
 - ~~a. In Zones A1—30, AO, and V1—30, from data contained in the "Flood Insurance Study-City of Biddeford, Maine," as described in Section 1; or~~
 - ~~b. In Zone A:
 - ~~(1) From any base flood elevation data from federal, state, or other technical sources (such as FEMA's Quick-2 model, FEMA-265/July 1995), including information obtained pursuant to Section 6K and 9D;~~~~~~

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~~(2) From the contour elevation extrapolated from a best fit analysis of the floodplain boundary when overlaid onto a USGS Quadrangle Map or other topographic map prepared by a professional land surveyor or registered professional engineer, if the floodplain boundary has a significant correlation to the elevation contour line(s); or, in the absence of all other data;~~

~~(3) To be the elevation of the ground at the intersection of the floodplain boundary and a line perpendicular to the shoreline which passes along the ground through the site of the proposed building.~~

~~2. Highest and lowest grades at the site adjacent to the walls of the proposed building;~~

~~3. Lowest floor, including basement; and whether or not such structures contain a basement; and,~~

~~4. Level, in the case of nonresidential structures only, to which the structure will be floodproofed;~~

~~I. A description of an elevation reference point established on the site of all developments for which elevation standards apply as required in Section 6;~~

~~J. A written certification by a professional land surveyor, registered professional engineer or architect, that the base flood elevations and grade elevations shown on the application are accurate;~~

~~K. The following certifications as required in Section 6 by a registered professional engineer or architect:~~

~~1. A floodproofing certificate (FEMA Form 81-65, 01/03, as amended), to verify that the floodproofing methods for any nonresidential structures will meet the floodproofing criteria of Section 3H4; Section 6G; and other applicable standards in Section 6;~~

~~2. A V-Zone certificate to verify that the construction in coastal high hazard areas, Zones V1—30, will meet the criteria of Section 6P; and other applicable standards in Section 6;~~

~~3. A hydraulic openings certificate to verify that engineered hydraulic openings in foundation walls will meet the standards of Section 6L2a;~~

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~~4. A certified statement that bridges will meet the standards of Section 6M;~~

~~5. A certified statement that containment walls will meet the standards of Section 6N;~~

~~L. A description of the extent to which any watercourse will be altered or relocated as a result of the proposed development; and~~

~~M. A statement of construction plans describing in detail how each applicable development standard in Section 6 will be met.~~

~~Section 4 **Application fee and expert's fee.**~~

~~{Ord. No. 2006.26, 5-2-2006}~~

~~A nonrefundable application fee shall be paid to the City through the Code Enforcement Office. This fee is separate from other required permit and review fees.~~

~~a. The fee for development projects will be \$100.~~

~~b. In cases where projects meet the definition for minor development the fee shall be \$50.~~

~~An additional fee may be charged if the Code Enforcement Officer and/or Board of Appeals needs the assistance of a professional engineer or other expert. The expert's fee shall be paid in full by the applicant within 10 days after the town submits a bill to the applicant. Failure to pay the bill shall constitute a violation of the ordinance and be grounds for the issuance of a stop work order. An expert shall not be hired by the municipality at the expense of an applicant until the applicant has either consented to such hiring in writing or been given an opportunity to be heard on the subject. An applicant who is dissatisfied with a decision to hire an expert may appeal that decision to the Board of Appeals.~~

~~Section 5 **Review standards for flood hazard development permit applications.**~~

~~{Ord. No. 2006.26, 5-2-2006}~~

~~The Code Enforcement Officer shall:~~

~~A. Review all applications for the flood hazard development permit to assure that proposed building sites are reasonably safe from flooding and to determine that all pertinent requirements of Section 6 (development standards) have, or will be met;~~

~~B. Utilize, in the review of all flood hazard development permit applications:~~

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- ~~1. The base flood data and floodway data contained in the "Flood Insurance Study—City of Biddeford, Maine," as described in Section 1.~~
- ~~2. In special flood hazard areas where base flood elevation and floodway data are not provided, the Code Enforcement Officer shall obtain, review and reasonably utilize any base flood elevation and floodway data from federal, state, or other technical sources, including information obtained pursuant to Section 3 H1b; Section 6K and Section 9D, in order to administer Section 6 of this ordinance.~~
- ~~C. Make interpretations of the location of boundaries of special flood hazard areas shown on the maps described in Section 1 of this ordinance;~~
- ~~D. In the review of flood hazard development permit applications, determine that all necessary permits have been obtained from those federal, state, and local government agencies from which prior approval is required by federal or state law, including but not limited to Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1344;~~
- ~~E. Notify adjacent municipalities, the Department of Environmental Protection, and the Maine Floodplain Management Program in the State Planning Office prior to any alteration or relocation of a watercourse and submit copies of such notifications to the Federal Emergency Management Agency;~~
- ~~F. If the application satisfies the requirements of this ordinance, approve the issuance of one of the following flood hazard development permits based on the type of development:~~
 - ~~1. A two-part flood hazard development permit for elevated structures. Part I shall authorize the applicant to build a structure to and including the first horizontal floor only above the base flood level. At that time the applicant shall provide the Code Enforcement Officer with an elevation certificate completed by a professional land surveyor, registered professional engineer or architect, based on the Part I permit construction, "as built," for verifying compliance with the elevation requirements of Section 6, Paragraphs F, G, H, or P. Following review of the elevation certificate data, which shall take place within 72 hours of receipt of the application, the Code Enforcement Officer shall issue Part II of the flood hazard development permit. Part II shall authorize the applicant to complete the construction project; or~~

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~~2. Issue a flood hazard development permit for flood proofing of nonresidential structures that are new construction or substantially improved nonresidential structures that are not being elevated but that meet the floodproofing standards of Section 6G1a, b, and c. The application for this permit shall include a floodproofing certificate signed by a registered professional engineer or architect; or~~

~~3. A flood hazard development permit for minor development for all development that is not new construction or a substantial improvement, such as repairs, maintenance, or renovations, whose value is less than 50% of the assessed value of the structure. Minor development also includes, but is not limited to: accessory structures as provided for in Section 6J, mining, dredging, filling, grading, paving, excavation, drilling operations, storage of equipment or materials, deposition or extraction of materials, public or private sewage disposal systems or water supply facilities that do not involve structures; and nonstructural projects such as bridges, dams, towers, fencing, pipelines, wharves, and piers.~~

~~G. Maintain, as a permanent record, copies of all flood hazard development permit applications, corresponding permits issued, and data relevant thereto, including reports of the Board of Appeals on variances granted under the provisions of Section 10 of this ordinance, and copies of elevation certificates, floodproofing certificates, certificates of compliance and certifications of design standards required under the provisions of Sections 3, 6, and 8 of this ordinance.~~

~~Section 6 Development standards.~~

~~[Ord. No. 2006.26, 5-2-2006]~~

~~All development in areas of special flood hazard shall meet the following applicable standards:~~

~~A. All development. All development shall:~~

~~1. Be designed or modified and adequately anchored to prevent flotation (excluding piers and docks), collapse or lateral movement of the development resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;~~

~~2. Use construction materials that are resistant to flood damage;~~

~~3. Use construction methods and practices that will minimize flood damage; and,~~

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- ~~4. Use electrical, heating, ventilation, plumbing, and air conditioning equipment, and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during flooding conditions.~~
- ~~B. Water supply. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems.~~
- ~~C. Sanitary sewage systems. All new and replacement sanitary sewage systems shall be designed and located to minimize or eliminate infiltration of floodwaters into the system and discharges from the system into floodwaters.~~
- ~~D. On-site waste disposal systems. On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during floods.~~
- ~~E. Watercourse carrying capacity. All development associated with altered or relocated portions of a watercourse shall be constructed and maintained in such a manner that no reduction occurs in the flood-carrying capacity of any watercourse.~~
- ~~F. Residential. New construction or substantial improvement of any residential structure located within:
 - ~~1. Zones A1—30 shall have the lowest floor (including basement) elevated to at least one foot above the base flood elevation.~~
 - ~~2. Zone AO shall have adequate drainage paths around structures on slopes, to guide floodwater away from the proposed structures.~~
 - ~~3. Zone AO shall have the lowest floor (including basement) elevated above the highest adjacent grade:
 - ~~a. At least one foot higher than the depth specified in feet on the community's flood insurance rate map; or,~~
 - ~~b. At least three feet if no depth number is specified.~~~~~~

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- ~~4. Zone A shall have the lowest floor (including basement) elevated to at least one foot above the base flood elevation utilizing information obtained pursuant to Section 3H1b; Section 5B; or Section 9D.~~
- ~~5. Zones V1—30 shall meet the requirements of Section 6D.~~

~~G. Nonresidential. New construction or substantial improvement of any nonresidential structure located within:~~

- ~~1. Zones A1—30 shall have the lowest floor (including basement) elevated to at least one foot above the base flood elevation, or together with attendant utility and sanitary facilities shall:~~
 - ~~a. Be floodproofed to at least one foot above the base flood elevation so that below that elevation the structure is watertight with walls substantially impermeable to the passage of water;~~
 - ~~b. Have structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy; and~~
 - ~~c. Be certified by a registered professional engineer or architect that the floodproofing design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of this section. Such certification shall be provided with the application for a flood hazard development permit, as required by Section 3K and shall include a record of the elevation above mean sea level to which the structure is floodproofed.~~
- ~~2. Zone AO shall have adequate drainage paths around structures on slopes, to guide floodwater away from the proposed structures.~~
- ~~3. Zone AO shall have the lowest floor (including basement) elevated above the highest adjacent grade:~~
 - ~~a. At least one foot higher than the depth specified in feet on the community's flood insurance rate map; or~~
 - ~~b. At least three feet if no depth number is specified; or~~

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~~c. Together with attendant utility and sanitary facilities be floodproofed to meet the elevation requirements of this section and floodproofing standards of Section 6G1.~~

~~4. Zone A shall have the lowest floor (including basement) elevated to at least one foot above the base flood elevation utilizing information obtained pursuant to Section 3H1b; Section 5B; or Section 9D; or~~

~~a. Together with attendant utility and sanitary facilities meet the floodproofing standards of Section 6G1.~~

~~5. Zones V1—30 shall meet the requirements of Section 6P.~~

~~H. Manufactured homes. New or substantially improved manufactured homes located within:~~

~~1. Zone A1—30 shall:~~

~~a. Be elevated on a permanent foundation such that the lowest floor (including basement) of the manufactured home is at least one foot above the base flood elevation; and~~

~~b. Be on a permanent foundation, which may be poured masonry slab or foundation walls, with hydraulic openings, or may be reinforced piers or block supports, any of which support the manufactured home so that no weight is supported by its wheels and axles; and~~

~~c. Be securely anchored to an adequately anchored foundation system to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to:~~

~~(1) Over the top ties anchored to the ground at the four corners of the manufactured home, plus two additional ties per side at intermediate points (manufactured homes less than 50 feet long require one additional tie per side); or by~~

~~(2) Frame ties at each corner of the home, plus five additional ties along each side at intermediate points (manufactured homes less than 50 feet long require four additional ties per side).~~

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~~(3) All components of the anchoring system described in Section 6, Paragraph H1c(1) and (2) shall be capable of carrying a force of 4,800 pounds.~~

~~2. Zone AO shall have adequate drainage paths around structures on slopes, to guide floodwater away from the proposed structures.~~

~~3. Zone AO shall have the lowest floor (including basement) elevated above the highest adjacent grade:~~

~~a. At least one foot higher than the depth specified in feet on the community's flood insurance rate map; or~~

~~b. At least three feet if no depth number is specified; and~~

~~c. Meet the anchoring requirements of Section 6H1c.~~

~~4. Zone A shall:~~

~~a. Be elevated on a permanent foundation as described in Section 6H1b, such that the lowest floor (including basement) of the manufactured home is at least one foot above the base flood elevation utilizing information obtained pursuant to Section 3H1b; Section 5B; or Section 9D; and~~

~~b. Meet the anchoring requirements of Section 6H1b.~~

~~5. Zones V1—30 shall meet the requirements of Section 6P.~~

~~I. Recreational vehicles. Recreational vehicles located within:~~

~~1. Zones A1—30 shall either:~~

~~a. Be on the site for fewer than 180 consecutive days;~~

~~b. Be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick~~

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~~disconnect type utilities and security devices, and has no permanently attached additions; or~~

~~c. Be permitted in accordance with the elevation and anchoring requirements for manufactured homes in Section 6H1.~~

~~2. Zones V1—30 shall meet the requirements of either Section 6I1a or b, or Section 6P.~~

~~J. Accessory structures. Accessory structures, as defined in Section 14, located within Zones A1—30, AO, and A, shall be exempt from the elevation criteria required in Section 6F and G above, if all other requirements of Section 6 and all the following requirements are met. Accessory structures shall:~~

~~1. Be 500 square feet or less and have a value less than \$3,000;~~

~~2. Have unfinished interiors and not be used for human habitation;~~

~~3. Have hydraulic openings, as specified in Section 6L2, in at least two different walls of the accessory structure;~~

~~4. Be located outside the floodway;~~

~~5. When possible be constructed and placed on the building site so as to offer the minimum resistance to the flow of floodwaters and be placed further from the source of flooding than is the primary structure; and~~

~~6. Have only ground fault interrupt electrical outlets. The electric service disconnect shall be located above the base flood elevation and when possible outside the special flood hazard area.~~

~~K. Floodways.~~

~~1. In Zones A1—30 riverine areas, encroachments, including fill, new construction, substantial improvement, and other development shall not be permitted within a regulatory floodway which is designated on the community's "flood boundary and floodway map," unless a technical evaluation certified by a registered professional engineer is provided demonstrating~~

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~~that such encroachments will not result in any increase in flood levels within the community during the occurrence of the base flood discharge.~~

~~2. In Zones A1—30 and A riverine areas for which no regulatory floodway is designated, encroachments, including fill, new construction, substantial improvement, and other development shall not be permitted in the floodway as determined in Section 6K3 unless a technical evaluation certified by a registered professional engineer is provided demonstrating that the cumulative effect of the proposed development, when combined with all other existing development and anticipated development:~~

~~a. Will not increase the water surface elevation of the base flood more than one foot at any point within the community; and~~

~~b. Is consistent with the technical criteria contained in Chapter 5 entitled "Hydraulic Analyses," Flood Insurance Study Guidelines and Specifications for Study Contractors, (FEMA 37/January 1995, as amended).~~

~~3. In Zones A1—30 and A riverine areas for which no regulatory floodway is designated, the regulatory floodway is determined to be the channel of the river or other watercourse and the adjacent land areas to a distance of one-half the width of the floodplain as measured from the normal high water mark to the upland limit of the floodplain.~~

~~L. Enclosed areas below the lowest floor. New construction or substantial improvement of any structure in Zones A1—30, AO, and A that meets the development standards of Section 6, including the elevation requirements of Section 6, Paragraphs F, G, or H and is elevated on posts, columns, piers, piles, stilts, or crawl spaces may be enclosed below the base flood elevation requirements, provided all the following criteria are met or exceeded:~~

~~1. Enclosed areas are not "basements" as defined in Section 14; and,~~

~~2. Enclosed areas shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwater. Designs for meeting this requirement must either:~~

~~a. Be certified by a registered professional engineer or architect; or~~

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~~b. Meet or exceed the following minimum criteria:~~

- ~~(1) A minimum of two openings having a total net area of not less than one square inch for every square foot of the enclosed area;~~
- ~~(2) The bottom of all openings shall be below the base flood elevation and no higher than one foot above the lowest grade; and~~
- ~~(3) Openings may be equipped with screens, louvers, valves, or other coverings or devices, provided that they permit the entry and exit of floodwaters automatically without any external influence or control such as human intervention, including the use of electrical and other nonautomatic mechanical means;~~

~~3. The enclosed area shall not be used for human habitation; and~~

~~4. The enclosed areas are usable solely for building access, parking of vehicles, or storage.~~

~~M. Bridges. New construction or substantial improvement of any bridge in Zones A1—30, AO, A, and V1—30 shall be designed such that:~~

- ~~1. When possible, the lowest horizontal member (excluding the pilings, or columns) is elevated to at least one foot above the base flood elevation; and~~
- ~~2. A registered professional engineer shall certify that:~~
 - ~~a. The structural design and methods of construction shall meet the elevation requirements of this section and the floodway standards of Section 6K; and~~
 - ~~b. The foundation and superstructure attached thereto are designed to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all structural components. Water loading values used shall be those associated with the base flood.~~

~~N. Containment walls. New construction or substantial improvement of any containment wall located within:~~

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~~1. Zones A1—30, A, and V1—30 shall:~~

- ~~a. Have the containment wall elevated to at least one foot above the base flood elevation;~~
- ~~b. Have structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy; and~~
- ~~c. Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of this section. Such certification shall be provided with the application for a flood hazard development permit, as required by Section 3K.~~

~~2. Zone AO shall have adequate drainage paths around containment walls on slopes, to guide floodwater away from the proposed walls.~~

~~3. Zone AO shall have the top of the containment wall elevated above the highest adjacent grade:~~

- ~~a. At least one foot higher than the depth specified in feet on the community's flood insurance rate map; or~~
- ~~b. At least three feet if no depth number is specified; and~~
- ~~c. Shall meet the requirements of Section 6N1b and c.~~

~~O. Wharves, piers and docks. New construction or substantial improvement of wharves, piers, and docks are permitted in Zones A1—30, AO, A, and V1—30, in and over water and seaward of the mean high tide if the following requirements are met:~~

- ~~1. Wharves, piers, and docks shall comply with all applicable local, state, and federal regulations; and~~
- ~~2. For commercial wharves, piers, and docks, a registered professional engineer shall develop or review the structural design, specifications, and plans for the construction.~~

~~P. Coastal floodplains.~~

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- ~~1. All new construction located within Zones A1—30, A, and V1—30 shall be located landward of the reach of mean high tide, except as provided in Section 6PG.~~
- ~~2. New construction or substantial improvement of any structure located within Zones V1—30 shall:~~
 - ~~a. Be elevated on posts or columns such that:~~
 - ~~(1) The bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to one foot above the base flood level;~~
 - ~~(2) The pile or column foundation and the elevated portion of the structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components; and~~
 - ~~(3) Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable state and local building standards.~~
 - ~~b. Have the space below the lowest floor:~~
 - ~~(1) Free of obstructions; or~~
 - ~~(2) Constructed with open wood lattice work, or insect screening intended to collapse under wind and water without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting piles or columns; or~~
 - ~~(3) Constructed with nonsupporting breakaway walls which have a design safe loading resistance of not less than 10 or more than 20 pounds per square foot.~~
 - ~~c. Require a registered professional engineer or architect to:~~
 - ~~a. Develop or review the structural design, specifications, and plans for the construction, which must meet or exceed the technical criteria contained in the Coastal Construction Manual, (FEMA-55/June, 2000); and~~
 - ~~b. Certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the criteria of Section 6L2.~~

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- ~~3. The use of fill for structural support in Zones V1—30 is prohibited.~~
- ~~4. Human alteration of sand dunes within Zones V1—30 is prohibited unless it can be demonstrated that such alterations will not increase potential flood damage.~~
- ~~5. The area below the lowest floor, shall be used solely for parking vehicles, building access, and storage.~~
- ~~6. Conditional use. Lobster sheds and fishing sheds may be located seaward of mean high tide and shall be exempt from the elevation requirement in Section 6G, only if permitted as a conditional use following review and approval by the Planning Board, as provided in Section 7, and if all the following requirements and those of Section 6A, 6K, and 6L are met:~~
 - ~~a. The conditional use shall be limited to low-value structures such as metal or wood sheds 200 square feet or less and shall not exceed more than one story.~~
 - ~~b. The structure shall be securely anchored to the wharf or pier to resist flotation, collapse, and lateral movement due to the effect of wind and water loads acting simultaneously on all building components.~~
 - ~~c. The structure will not adversely increase wave or debris impact forces affecting nearby buildings.~~
 - ~~d. The structure shall have unfinished interiors and shall not be used for human habitation.~~
 - ~~e. Any mechanical, utility equipment and fuel storage tanks must be anchored and either elevated or floodproofed to one foot above the base flood elevation.~~
 - ~~f. All electrical outlets shall be ground fault interrupt type. The electrical service disconnect shall be located on shore above the base flood elevation and when possible outside the special flood hazard area.~~

Section 7 ~~Conditional use review.~~
[Ord. No. 2006.26, 5-2-2006]

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~~The Planning Board shall hear and decide upon applications for conditional uses provided for in this ordinance. The Planning Board shall hear and approve, approve with conditions, or disapprove all applications for conditional uses. An applicant informed by the Code Enforcement Officer that a conditional use permit is required shall file an application for the permit with the Planning Board.~~

~~**A. Review procedure for a conditional use flood hazard development permit.**~~

- ~~1. The flood hazard development permit application with additional information attached addressing how each of the conditional use criteria specified in the ordinance will be satisfied, may serve as the permit application for the conditional use permit.~~
- ~~2. Before deciding any application, the Planning Board shall hold a public hearing on the application within 30 days of their receipt of the application.~~
- ~~3. If the Planning Board finds that the application satisfies all relevant requirements of the ordinance, the Planning Board must approve the application or approve with conditions within 45 days of the date of the public hearing.~~
- ~~4. A conditional use permit issued under the provisions of this ordinance shall expire if the work or change involved is not commenced within 180 days of the issuance of the permit by the Planning Board.~~
- ~~5. The applicant shall be notified by the Planning Board in writing over the signature of the Chairman of the Planning Board that flood insurance is not available for structures located entirely over water or seaward of mean high tide.~~

~~**B. Expansion of conditional uses.**~~

- ~~1. No existing building or use of premises may be expanded or enlarged without a permit issued under this section if that building or use was established or constructed under a previously issued conditional use permit or if it is a building or use which would require a conditional use permit if being newly established or constructed under this ordinance.~~

~~**Section 8 Certificate of compliance.**~~

~~[Ord. No. 2006.26, 5-2-2006]~~

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~~No land in a special flood hazard area shall be occupied or used and no structure which is constructed or substantially improved shall be occupied until a certificate of compliance is issued by the Code Enforcement Officer subject to the following provisions:~~

~~A. For new construction or substantial improvement of any elevated structure the applicant shall submit to the Code Enforcement Officer:~~

~~1. An elevation certificate completed by a professional land surveyor, registered professional engineer, or architect, for compliance with Section 6, paragraphs F, G, H, or P; and~~

~~2. For structures in Zones V1—30, certification by a registered professional engineer or architect that the design and methods of construction used are in compliance with Section 6P2.~~

~~B. The applicant shall submit written notification to the Code Enforcement Officer that the development is complete and complies with the provisions of this ordinance.~~

~~C. Within 10 working days, the Code Enforcement Officer shall:~~

~~1. Review the required certificate(s) and the applicant's written notification; and~~

~~2. Upon determination that the development conforms with the provisions of this ordinance, shall issue a certificate of compliance.~~

~~**Section 9 Review of subdivision and development proposals.**
[Ord. No. 2006.26, 5-2-2006]~~

~~The Planning Board shall, when reviewing subdivisions and other proposed developments that require review under other federal law, state law or local ordinances or regulations and all projects on five or more disturbed acres, or in the case of manufactured home parks divided into two or more lots, assure that:~~

~~A. All such proposals are consistent with the need to minimize flood damage.~~

~~B. All public utilities and facilities, such as sewer, gas, electrical and water systems are located and constructed to minimize or eliminate flood damages.~~

~~C. Adequate drainage is provided so as to reduce exposure to flood hazards.~~

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- ~~D.—All proposals include base flood elevations, flood boundaries, and, in a riverine floodplain, floodway data. These determinations shall be based on engineering practices recognized by the Federal Emergency Management Agency.~~
- ~~E.—Any proposed development plan must include a condition of plan approval requiring that structures on any lot in the development having any portion of its land within a special flood hazard area, are to be constructed in accordance with Section 6 of this ordinance. Such requirement will be included in any deed, lease, purchase and sale agreement, or document transferring or expressing an intent to transfer any interest in real estate or structure, including but not limited to a time share interest. The condition shall clearly articulate that the municipality may enforce any violation of the construction requirement and that fact shall also be included in the deed or any other document previously described. The construction requirement shall also be clearly stated on any map, plat, or plan to be signed by the Planning Board or local reviewing authority as part of the approval process.~~

~~Section 10 Appeals and variances.~~
~~[Ord. No. 2006.26, 5-2-2006]~~

~~The Board of Appeals of the City of Biddeford may, upon written application of an aggrieved party, hear and decide appeals where it is alleged that there is an error in any order, requirement, decision, or determination made of the Code Enforcement Officer or Planning Board in the administration or enforcement of the provisions of this ordinance. The Board of Appeals may grant a variance from the requirements of this ordinance consistent with state law and the following criteria:~~

- ~~A.—Variances shall not be granted within any designated regulatory floodway if any increase in flood levels during the base flood discharge would result.~~
- ~~B.—Variances shall be granted only upon:~~
- ~~1. A showing of good and sufficient cause; and,~~
 - ~~2. A determination that should a flood comparable to the base flood occur, the granting of a variance will not result in increased flood heights, additional threats to public safety, public expense, or create nuisances, cause fraud or victimization of the public or conflict with existing local laws or ordinances; and,~~
 - ~~3. A showing that the issuance of the variance will not conflict with other state, federal or local laws or ordinances; and,~~

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- ~~4. A determination that failure to grant the variance would result in "undue hardship," which in this subsection means:~~
- ~~a. That the land in question cannot yield a reasonable return unless a variance is granted; and~~
 - ~~b. That the need for a variance is due to the unique circumstances of the property and not to the general conditions in the neighborhood; and~~
 - ~~c. That the granting of a variance will not alter the essential character of the locality; and~~
 - ~~d. That the hardship is not the result of action taken by the applicant or a prior owner.~~
- ~~C. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief, and the Board of Appeals may impose such conditions to a variance as it deems necessary.~~
- ~~D. Variances may be issued for new construction, substantial improvements, or other development for the conduct of a functionally dependent use provided that:~~
- ~~1. Other criteria of Section 10 and Section 6K are met; and~~
 - ~~2. The structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.~~
- ~~E. Variances may be issued by a community for the repair, reconstruction, rehabilitation, or restoration of historic structures upon the determination that:~~
- ~~1. The development meets the criteria of Section 10, Paragraphs A through D above; and~~
 - ~~2. The proposed repair, reconstruction, rehabilitation, or restoration will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.~~

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~~F. Any applicant who meets the criteria of Section 10, Paragraphs A through E shall be notified by the Board of Appeals in writing over the signature of the Chairman of the Board of Appeals that:~~

- ~~1. The issuance of a variance to construct a structure below the base flood level will result in greatly increased premium rates for flood insurance up to amounts as high as \$25 per 100 of insurance coverage;~~
- ~~2. Such construction below the base flood level increases risks to life and property; and,~~
- ~~3. The applicant agrees in writing that the applicant is fully aware of all the risks inherent in the use of land subject to flooding, assumes those risks and agrees to indemnify and defend the municipality against any claims filed against it that are related to the applicant's decision to use land located in a floodplain and that the applicant individually releases the municipality from any claims the applicant may have against the municipality that are related to the use of land located in a floodplain.~~

~~G. Appeal procedure for administrative and variance appeals.~~

- ~~1. An administrative or variance appeal may be taken to the Board of Appeals by an aggrieved party within 30 days after receipt of a written decision of the Code Enforcement Officer or Planning Board.~~
- ~~2. Upon being notified of an appeal, the Code Enforcement Officer or Planning Board, as appropriate, shall transmit to the Board of Appeals all of the papers constituting the record of the decision appealed from.~~
- ~~3. The Board of Appeals shall hold a public hearing on the appeal within 35 days of its receipt of an appeal request.~~
- ~~4. The person filing the appeal shall have the burden of proof.~~
- ~~5. The Board of Appeals shall decide all appeals within 35 days after the close of the hearing, and shall issue a written decision on all appeals.~~

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- ~~6. The Board of Appeals shall submit to the Code Enforcement Officer a report of all variance actions, including justification for the granting of the variance and an authorization for the Code Enforcement Officer to issue a flood hazard development permit, which includes any conditions to be attached to said permit.~~
- ~~7. Any aggrieved party who participated as a party during the proceedings before the Board of Appeals may take an appeal to Superior Court in accordance with state laws within 45 days from the date of any decision of the Board of Appeals.~~

~~Section 11 Enforcement and penalties.~~
~~{Ord. No. 2006.26, 5-2-2006}~~

- ~~A. It shall be the duty of the Code Enforcement Officer to enforce the provisions of this ordinance pursuant to 30-A M.R.S.A. § 4452.~~
- ~~B. The penalties contained in 30-A M.R.S.A. § 4452 shall apply to any violation of this ordinance.~~
- ~~C. In addition to any other actions, the Code Enforcement Officer, upon determination that a violation exists, shall submit a declaration to the Administrator of the Federal Insurance Administration requesting a denial of flood insurance. The valid declaration shall consist of:~~
- ~~1. The name of the property owner and address or legal description of the property sufficient to confirm its identity or location;~~
 - ~~2. A clear and unequivocal declaration that the property is in violation of a cited state or local law, regulation, or ordinance;~~
 - ~~3. A clear statement that the public body making the declaration has authority to do so and a citation to that authority;~~
 - ~~4. Evidence that the property owner has been provided notice of the violation and the prospective denial of insurance; and,~~
 - ~~5. A clear statement that the declaration is being submitted pursuant to Section 1316 of the National Flood Insurance Act of 1968, as amended.~~

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~~Section 12 **Validity and severability.**
[Ord. No. 2006.26, 5-2-2006]~~

~~If any section or provision of this ordinance is declared by the courts to be invalid, such decision shall not invalidate any other section or provision of this ordinance.~~

~~Section 13 **Conflict with other ordinances.**
[Ord. No. 2006.26, 5-2-2006]~~

~~This ordinance shall not in any way impair or remove the necessity of compliance with any other applicable rule, ordinance, regulation, by law, permit, or provision of law. Where this ordinance imposes a greater restriction upon the use of land, buildings, or structures, the provisions of this ordinance shall control.~~

~~Section 14 **Definitions.**
[Ord. No. 2006.26, 5-2-2006]~~

~~Unless specifically defined below, words and phrases used in this ordinance shall have the same meaning as they have at common law and to give is ordinance its most reasonable application. Words used in the present tense include the future, the singular number includes the plural, and the plural number includes the singular. The word "may" is permissive; "shall" is mandatory and not discretionary.~~

~~**ACCESSORY STRUCTURE**~~

~~A small detached structure that is incidental and subordinate to the principal structure.~~

~~**ADJACENT GRADE**~~

~~The natural elevation of the ground surface prior to construction next to the proposed walls of a structure.~~

~~**AREA OF SHALLOW FLOODING**~~

~~A designated AO and AH Zone on a community's flood insurance rate map (FIRM) with a one-percent or greater annual chance of flooding to an average depth of one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.~~

~~**AREA OF SPECIAL FLOOD HAZARD**~~

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~~The land in the floodplain having a one-percent or greater chance of flooding in any given year, as specifically identified in the flood insurance study cited in Section 1 of this ordinance.~~

~~BASE FLOOD~~

~~The flood having a one-percent chance of being equaled or exceeded in any given year; commonly called the "one-hundred-year flood."~~

~~BASEMENT~~

~~Any area of the building having its floor subgrade (below ground level) on all sides.~~

~~BREAKAWAY WALL~~

~~A wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.~~

~~BUILDING~~

~~See "structure."~~

~~CERTIFICATE OF COMPLIANCE~~

~~A document signed by the Code Enforcement Officer stating that a structure is in compliance with all of the provisions of this ordinance.~~

~~CODE ENFORCEMENT OFFICER~~

~~A person certified under 30-A M.R.S.A., § 4451 (including exceptions in Subsection 4451, Paragraph 1) and employed by a municipality to enforce all applicable comprehensive planning and land use laws and ordinances.~~

~~CONDITIONAL USE~~

~~A use that because of its potential impact on surrounding areas and structures, is permitted only upon review and approval by the Planning Board pursuant to Section 7.~~

~~DEVELOPMENT~~

~~Any man-made change to improved or unimproved real estate, including but not limited to the construction of buildings or other structures; the construction of additions or substantial improvements to buildings or other structures; mining, dredging, filling, grading, paving,~~

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~~excavation, drilling operations or storage of equipment or materials; and the storage, deposition, or extraction of materials, public or private sewage disposal systems or water supply facilities.~~

ELEVATED BUILDING

A nonbasement building:

- ~~a. Built, in the case of a building in Zones A1—30, A, or AO to have the top of the elevated floor, or in the case of a building in Zones V1—30, to have the bottom of the lowest horizontal structural member of the elevated floor, elevated above the ground level by means of pilings, columns, post, piers, or stilts; and~~
- ~~b. Adequately anchored so as not to impair the structural integrity of the building during a flood of up to one foot above the magnitude of the base flood.~~

~~In the case of Zones A1—30, A, or AO, "elevated building" also includes a building elevated by means of fill or solid foundation perimeter walls with hydraulic openings sufficient to facilitate the unimpeded movement of flood waters, as required in Section 6L. In the case of Zones V1—30, "elevated building" also includes a building otherwise meeting the definition of "elevated building," even though the lower area is enclosed by means of breakaway walls, if the breakaway walls meet the standards of Section 6P2b(3).~~

ELEVATION CERTIFICATE

~~An official form (FEMA Form 81-31, 01/03, as amended) that:~~

- ~~a. Is used to verify compliance with the floodplain management regulations of the National Flood Insurance Program; and~~
- ~~b. Is required for purchasing flood insurance.~~

FLOOD or FLOODING

~~a. A general and temporary condition of partial or complete inundation of normally dry land areas from:~~

- ~~1. The overflow of inland or tidal waters.~~
- ~~2. The unusual and rapid accumulation or runoff of surface waters from any source.~~

~~b. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature,~~

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~~such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in Paragraph a1 of this definition.~~

~~FLOOD ELEVATION STUDY~~

~~An examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations.~~

~~FLOOD INSURANCE RATE MAP (FIRM)~~

~~An official map of a community, on which the administrator of the federal insurance administration has delineated both the special hazard areas and the risk premium zones applicable to the community.~~

~~FLOOD INSURANCE STUDY~~

~~See "flood elevation study."~~

~~FLOODPLAIN or FLOOD-PRONE AREA~~

~~Any land area susceptible to being inundated by water from any source. (See "flooding")~~

~~FLOODPLAIN MANAGEMENT~~

~~The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works, and floodplain management regulations.~~

~~FLOODPLAIN MANAGEMENT REGULATIONS~~

~~Zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a floodplain ordinance, grading ordinance, and erosion control ordinance) and other applications of police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.~~

~~FLOODPROOFING~~

~~Any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and contents.~~

~~FLOODWAY~~

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See "regulatory floodway."

FLOODWAY ENCROACHMENT LINES

The lines marking the limits of floodways on federal, state, and local floodplain maps.

FREEBOARD

A factor of safety usually expressed in feet above a flood level for purposes of floodplain management. Freeboard tends to compensate for the many unknown factors, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed, that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions.

FUNCTIONALLY DEPENDENT USE

A use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long term storage or related manufacturing facilities.

HISTORIC STRUCTURE

Any structure that is:

- a. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- b. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary of the Interior to qualify as a registered historic district;
- c. Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or
- d. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
 - 1. By an approved state program as determined by the Secretary of the Interior; or

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~~2. Directly by the Secretary of the Interior in states without approved programs.~~

~~LOCALLY ESTABLISHED DATUM~~

~~For purposes of this ordinance, an elevation established for a specific site to which all other elevations at the site are referenced. This elevation is generally not referenced to the National Geodetic Vertical Datum (NGVD) or any other established datum and is used in areas where mean sea level data is too far from a specific site to be practically used.~~

~~LOWEST FLOOR~~

~~The lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements described in Section 6 of this ordinance.~~

~~MANUFACTURED HOME~~

~~A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes the term "manufactured home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days.~~

~~MANUFACTURED HOME PARK OR SUBDIVISION~~

~~A parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.~~

~~MEAN SEA LEVEL~~

~~For purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of 1929, or other datum, to which base flood elevations shown on a community's flood insurance rate map are referenced.~~

~~MINOR DEVELOPMENT~~

~~All development that is not new construction or a substantial improvement, such as repairs, maintenance, renovations, or additions, whose value is less than 50% of the market value of the structure. It includes, but is not limited to: accessory structures as provided for in Section 6J, mining, dredging, filling, grading, paving, excavation, drilling operations, storage of equipment or materials, deposition or extraction of materials, public or private sewage~~

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~~disposal systems or water supply facilities that do not involve structures; and nonstructural projects such as bridges, dams, towers, fencing, pipelines, wharves, and piers.~~

~~NATIONAL GEODETIC VERTICAL DATUM (NGVD)~~

~~The national vertical datum, whose standard was established in 1929, which is used by the National Flood Insurance Program (NFIP). NGVD was based upon mean sea level in 1929 and also has been called "1929 Mean Sea Level (MSL)".~~

~~NEW CONSTRUCTION~~

~~Structures for which the start of construction commenced on or after the effective date of floodplain management regulations adopted by a community and includes any subsequent improvements to such structures.~~

~~ONE-HUNDRED-YEAR FLOOD~~

~~See "base flood."~~

~~RECREATIONAL VEHICLE~~

~~A vehicle which is:~~

- ~~a. Built on a single chassis;~~
- ~~b. Four hundred square feet or less when measured at the largest horizontal projection, not including slideouts;~~
- ~~c. Designed to be self-propelled or permanently towable by a motor vehicle; and~~
- ~~d. Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.~~

~~REGULATORY FLOODWAY~~

~~a. The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot; and~~

~~b. When not designated on the community's flood boundary and floodway map, it is considered to be the channel of a river or other watercourse and the adjacent land areas to a distance of 1/2 the width of the floodplain, as measured from the normal high water mark to the upland limit of the floodplain.~~

~~RIVERINE~~

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~~Relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.~~

~~SPECIAL FLOOD HAZARD AREA~~

~~See "area of special flood hazard."~~

~~START OF CONSTRUCTION~~

~~The date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, substantial improvement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of pipes, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, or modification of any construction element, whether or not that alteration affects the external dimensions of the building.~~

~~STRUCTURE~~

~~For floodplain management purposes, a walled and roofed building. A gas or liquid storage tank that is principally above ground is also a structure.~~

~~SUBSTANTIAL DAMAGE~~

~~Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damage condition would equal or exceed 50% of the assessed value of the structure before the damage occurred.~~

~~SUBSTANTIAL IMPROVEMENT~~

~~Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the assessed value of the structure before the start of construction of the improvement. This term includes structures which have incurred substantial damage, regardless of the actual repair work performed. The term does not, however, include either:~~

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~~a. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or~~

~~b. Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure, and a variance is obtained from the Board of Appeals.~~

VARIANCE

~~A grant of relief by a community from the terms of a floodplain management regulation.~~

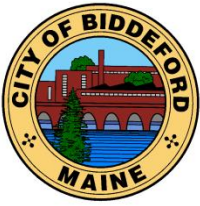
VIOLATION

~~The failure of a structure or development to comply with a community's floodplain management regulations.~~

Section 15 Abrogation.

~~[Ord. No. 2006.26, 5-2-2006]~~

~~This ordinance repeals and replaces any municipal ordinance previously enacted to comply with the National Flood Insurance Act of 1968 (P.L. 90-488, as amended).~~



CITY OF BIDDEFORD

Planning and Development Department

David C.M. Galbraith
Deputy Director/City Planner
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115

David.Galbraith@biddefordmaine.org

PLANNING BOARD STAFF REPORT

TO: Chair Patoine and Members of the Biddeford Planning Board

FROM: David C.M. Galbraith, Deputy Director/City Planner

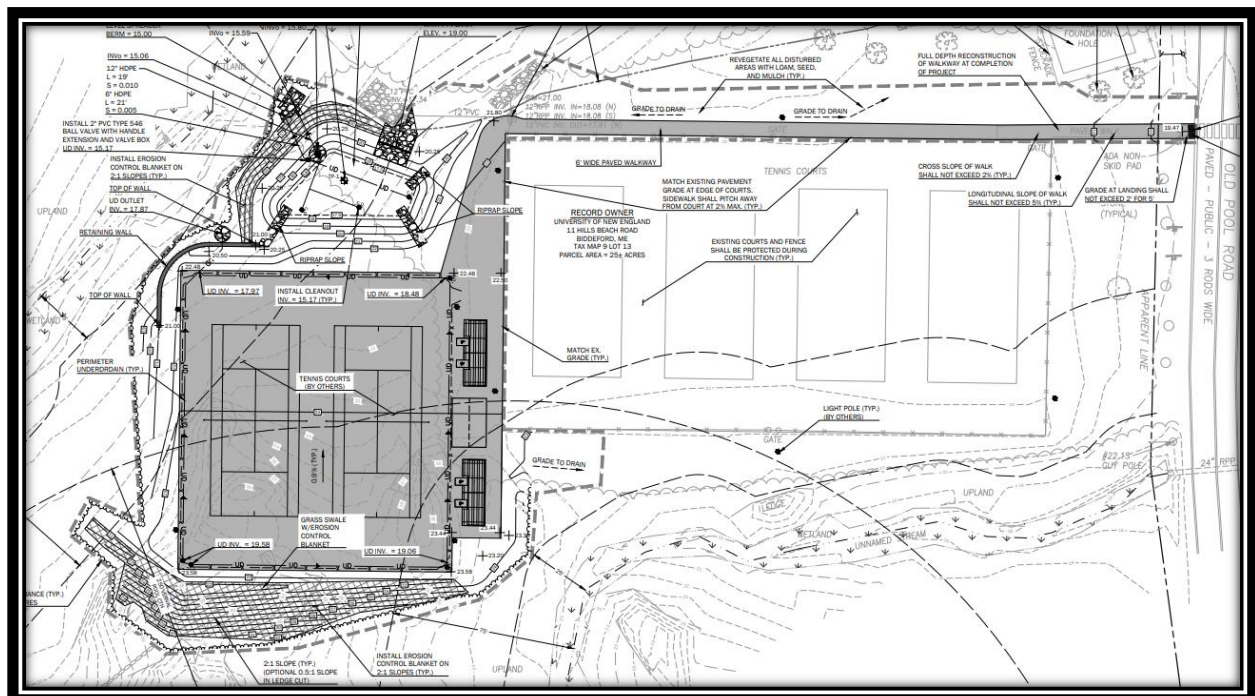
DATE: May 6, 2024

RE: **2024.10 Preliminary Site Plan Review for University of New England to expand the tennis courts at 16 Old Pool Road (Tax Map 9, Lot 13) in the Institutional Zone.**

MEETING DATE: May 15, 2024 at 6:00 PM

1. INTRODUCTION

The University of New England (UNE) would like to expand the tennis courts with the construction of a 122 ft. x 110 ft. bituminous paved surface, for the installation of two tennis courts. The courts will be located westerly of the four existing courts on Old Pool Road in a currently undeveloped portion of the campus. The existing site is wooded and lawn area, with wetlands to the north and south, and a city SP zone to the northeast. No wetlands will be impacted by the project. The construction will also take place within 250 ft. of a significant vernal pool. A NRPA permit by rule notification will be submitted to DEP.



2024.10 Preliminary Site Plan Review for University of New England to expand the tennis courts at 16 Old Pool Road (Tax Map 9, Lot 13) in the Institutional Zone.

Planning Board Meeting Date: May 15, 2024

Additionally, a new sidewalk will be constructed from Old Pool Road to the tennis courts. The courts will be used for varsity level play and recreational use. This project involves the construction of two paved tennis courts adjacent to the existing courts on the UNE Campus. UNE is preparing to add tennis as a varsity sport to its athletic programs. The NCAA requires a minimum of 6 courts to compete at a varsity level. Like other athletic venues on campus, all six courts would be illuminated. Practices, meets, and tournaments would be played in the off academic hours which would require illumination for completion of those events. In addition to the new courts and lighting, the project includes a storm water management system, a small storage and observation structure, and common site amenities such as a bike rack, benches, and trash receptacles.

The project is located in the Institutional zone where University uses are permitted. The site layout and design are in conformance with the applicable Site Plan Review criteria outlined in Part III, Article XI of the Biddeford Zoning Ordinance. The location, size, and activity of the proposed tennis courts are consistent with the previously approved UNE Institutional Zone Master Plan submission.

This is the first time this application is being reviewed by the Planning Board. Final Plan approval is required.

PROJECT DATA/INFORMATION

1.	Applicant:	University of New England 11 Hills Beach Road Biddeford, ME 04005
2.	Owner of Property:	Same as applicant
3.	Agent:	Tom Saucier of Site Design Associates 23 Whitney Way Topsham, ME 04086
4.	Engineer:	Same as Agent
5.	Project Location:	16 Old Pool Road
6.	Project Tax Map #/Lot #:	Tax Map 9, Lot 13
7.	Lot Size:	30.12 Acres
8.	Base Zoning:	IN
9.	Overlay Zoning:	N/A
10.	Existing Use:	Tennis Courts
11.	Proposed Use:	Expand Tennis Courts
12.	Approvals Required:	Preliminary Plan Review Final Plan Review
13.	Uses in the Vicinity:	Institution & Residential
14.	Waivers Needed:	a. None
18.	Waivers Granted:	a. None
22.	Other Non-City Permits Required:	
23.	Fees Paid:	Yes
25.	Planning Board Review History:	May 15, 2024-Preliminary

2. REVIEW PROCESS

Per City ordinance, this application is subject to Site Plan (Land Development Regulations, Article XI) review and approval by the Planning Board.

3. DEPARTMENTAL REVIEW COMMENTS:

2024.10 Preliminary Site Plan Review for University of New England to expand the tennis courts at 16 Old Pool Road (Tax Map 9, Lot 13) in the Institutional Zone.

Planning Board Meeting Date: May 15, 2024

Staff has reviewed the submitted plans and is supportive of the proposed tennis courts. The project is currently being assessed by our Engineering Peer Reviewer. Comments shall be addressed prior to final plan review.

4. STAFF RECOMMENDATION

Staff is supportive of the project and does not anticipate any insurmountable issues with the peer review of the stormwater application / analysis. Therefore, is requesting that the Planning Board approve the preliminary site plan review, with the following Conditions of Approval:

- 1. Standard Conditions of Approval.
- 2. All conditions previously approved for the University of New England (UNE), by the Planning Board, are hereby reaffirmed.

5. SAMPLE MOTIONS:

A. Motion to approve Case # 2024.10 Preliminary Plan Review for UNE to expand their tennis courts located at 16 Old Pool Road (Tax Map 9, Lot 13), with the recommended Conditions of Approval.

B. Motion to Table Case # 2024.10 Preliminary Plan Review for UNE to expand their tennis courts located at 16 Old Pool Road (Tax Map 9, Lot 13), based upon the following reasons:

- a) _____
- b) _____
- c) _____

C. Motion to Deny Case # 2024.10 Preliminary Plan Review for UNE to expand their tennis courts located at 16 Old Pool Road (Tax Map 9, Lot 13), based upon the following reasons:

- a) _____
- b) _____
- c) _____

UNIVERSITY OF NEW ENGLAND
SITE PLAN REVIEW APPLICATION

Project:

PROPOSED TENNIS COURT EXPANSION
16 OLD POOL ROAD
BIDDEFORD, MAINE

Applicant:

UNIVERSITY OF NEW ENGLAND

February 14, 2024

Prepared by:

Site Design Associates
23 Whitney Way
Topsham, Maine 04086
Ph: 207-449-4275
Email: info@sitedesignassociates.biz

Site Design Associates

Consulting Engineering and Land Planning

February 14, 2024

David Galbraith, City Planner
City of Biddeford
P.O. Box 586
205 Main Street
Biddeford, ME 04005

RE: Proposed Tennis Court Expansion
University of New England

Dear David and Planning Board Members:

On behalf of University of New England (UNE), Site Design Associates is pleased to submit the enclosed plans and documentation in support of an application for Site Plan Approval for the construction of two new tennis courts. The project site is located in the Institutional Zone (IN) zone. The project is shown on the most recent city approved master plan.

We have included the following information in support of this application:

- Formal Site Plan Review Application
- Letter of Agent Authorization
- City Drawing Checklist
- Site Location Map
- Stormwater Management Report
- Drawings (seven full size copies)
 - C-100 Existing Conditions Plan
 - C-101 Site Demolition and Erosion Control Plan
 - C-200 Site Plan
 - C-201 Grading, Drainage, and Erosion Control Plan
 - E-100 Vernal Pool critical Terrestrial Habitat Plan
 - C-300 Erosion & Sedimentation Control Notes and Details
 - C-301 Civil Details
 - C-302 Civil Details
 - L-100 Tennis Court Details
 - L-101 Tennis Court Details
 - L-102 Lighting Details

This project involves the construction of two paved tennis courts adjacent to the existing courts on the UNE Campus. UNE is preparing to add tennis as a varsity sport to its athletic programs. The NCAA requires a minimum of 6 courts to compete at a varsity level. Like other athletic venues on campus, all six courts would be illuminated.

Practices, meets, and tournaments would be played in the off academic hours which would require illumination for completion of those events. In addition to the new courts and lighting, the project includes a storm water management system, a small storage and observation structure, and common site amenities such as a bike rack, benches, and trash receptacles.

The following addresses Site Plan Approval/ Site Design Criteria in separate sections.

I. General

The plans for the project detail the construction of a 122 ft x 110 ft bituminous paved surface, for the installation of two tennis courts. The courts will be located westerly of the four existing courts on Old Pool Road in a currently undeveloped portion of the campus. The existing site is wooded and lawn area, with wetlands to the north and south, and a city SP zone to the northeast. No wetlands will be impacted by the project. The construction will also take place within 250 ft of a significant vernal pool. A NRPA permit by rule notification will be submitted to DEP.

Additionally, a new sidewalk will be constructed from Old Pool Road to the tennis courts.

The courts will be used for varsity level play and recreational use.

The project is located in the Institutional zone where University uses are permitted. The site layout and design are in conformance with the applicable Site Plan Review criteria outlined in Part III, Article XI of the Biddeford Zoning Ordinance. The location, size, and activity of the proposed tennis courts are consistent with the previously approved UNE Institutional Zone Master Plan submission.

II. Site Plan Approval/Site Design Criteria

1. Drainage

The report demonstrates compliance with Maine Department of Environmental Protection (DEP) Basic and General standards, and city requirements. A Stormwater Management Report is attached. The project will include an underdrained soil filter designed to DEP BMP standards for enhancement of stormwater runoff quality.

In 2006 UNE installed four new 24" diameter culverts under Old Pool Road. During the approval process for the existing tennis courts, both the DEP and City agreed that the flooding standard did not apply, due to the downstream improvements made by UNE and the fact that the drainage below the culverts

is tidal. The Stormwater Management Report includes an analysis of the culverts which demonstrates that there will be no impact on the capacity of the culverts.

2. Utilities

No sanitary sewers are proposed.

3. Parking

Not applicable.

4. Structural Layout and Design

a) Design of Buildings

The only structures proposed are a press box and portable bleachers. A preliminary rendering of the press box is attached.

b) Setbacks

The tennis courts are sited in conformance with all setback requirements.

c) Fire Protection & Safety

The fire department requested that we provide a radius in the new sidewalk pavement to accommodate gator access to the courts. This has been incorporated into the site drawings.

d) Landscaping

Native vegetation will remain as a buffer around the site.

e) Service, Storage, and Utility Areas

Not applicable

f) Paving, Parking, and Storage Areas

Not applicable.

g) Handicapped Accessibility

The walkway to the tennis courts will be ADA compliant.

h) Loading Facilities

No buildings are proposed.

i) Parking, Loading, and Protective Buffers

Not applicable.

j) Open Space

Existing vegetation will be preserved to the extent practical.

k) External Lighting

New lighting is proposed for the tennis courts. Ten 40 ft to 50 ft poles with fixtures are proposed; six for the existing courts and four for the proposed courts. A photometric plan and lighting details are included in the plan set. Note that the fixtures are fully cut off and there will be minimal illumination beyond the tennis courts with no light trespass off the property.

l) Signs

Not applicable.

m) Historic and Archeological Resources.

No part of the site has been identified as containing historic or archaeological resources.

We are currently soliciting a general contractor and a tennis court specialist to undertake the work and would prefer to provide the performance guarantee cost estimate when the contractors are on board and have priced it. We are in hopes that the planning board could consider this as a condition of approval.

Please let me know if staff has any questions, comments, or suggestions relative to this proposal. We look forward to meeting with the Planning Board at the next available meeting to discuss this project. to discuss this project.

Sincerely,
Site Design Associates



Tom Saucier, P.E.
President

cc: Andrew Philippe, RA, NCARB, Director for Campus Planning

Attachment 1
Formal Site Plan Review Application

**City of Biddeford – Planning Department****Planning Board Application**

P.O. Box 586, 205 Main Street Biddeford, Maine 04005
207-284-9115

Type of Application:

☒ Shoreland Zoning Permit ☒ Site Plan Review ___ Extraction
___ Conditional Use Permit ___ Subdivision ___ Private Way
___ Other: _____

Applicant Information:

Name: University of New England
Mailing Address: 11 Hills Beach Road Biddeford, ME 04005
Telephone: 207-602-2365
Email: aphilippe@une.edu

What is your legal interest in the property?

☒ Owner ___ Potential Buyer with Contract ___ Lease/Rental Agreement

Owner's Information:

Name: Same as applicant
Mailing Address: _____
Telephone: _____
Email: _____

Agent's Information:

Name: Tom Saucier, Site Design Associates
Mailing Address: 23 Whitney Way Topsham, ME 04086
Telephone: 207-449-4275
Email: tsaucier@sitedesignassocites.biz

Engineer/Surveyor's Information:

Name: Agent
Mailing Address: _____
Telephone: _____
Email: _____

Project Location and Lot Information:

Street Address: 16 Old Pool Road Drainage Watershed: unnamed tributary to Biddeford Pool
Tax Map: 9 Lot: 13
Current Zoning: IN Shoreland Zoning: SP
Size of Lot: 25 +/- (x)acres ()s.f. Lot Frontage: 950 ft +/-
Existing Use of Property: Tennis courts/open space

Property currently serviced by:

___ City Road ___ Public Sewer ___ Public Water ___ Public Trash
___ Private Road ___ Septic System ___ Private Well ___ 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

Is the project within the 100-year floodplain? ___ (Yes) ☒ (No) if yes attach information

Do you plan to bring fill onto the lot? ☒ (Yes) ___ (No) If yes attach information See plans.

Description of proposed use of property:

Project/Proposed Use:

Two new tennis courts and associated stormwater management facilities.

Property to be Serviced by:

☒ City Road ☐ Public Sewer ☐ Public Water ☐ Public Trash
☐ Private Road ☐ Septic System ☐ Private Well ☐ Private Hauler

Limits of Disturbance: 23,000 sf () acres (x)s.f.

Net change in impervious cover: 18,200 () acres (x)s.f.

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

Is the project proposing a new Private or Public Road? ☐ (Yes, Private) ☐ (Yes, Public) ☒ (No)

Is this project within the Urbanized Area/MS4 (see [City Drainage Map](#)) ☐ (Yes) ☒ (No)

Is the project proposing any Stormwater facilities/BMPs? ☒ (Yes) ☐ (No)

Will a Traffic Movement Permit (TMP) be required?: ☐ (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 structure: _____

Total new square feet paving/parking: 18,200 sf

Waiver Requests (attach details):

1. Article XI.5.B.1.e.3. - Slopes steeper than 2: 1 in ledge.
2. _____
3. _____
4. _____
5. _____

Required Submittal 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 Department – 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. Engineering Plans, as required.
- F. Stormwater Management Report, as required.

Fees (Due at time of Submission):

- \$75 Nonrefundable Administration Fee is required for every 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 its 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 the review for special studies, legal review costs, and/or engineering review.
- I understand that by submitting an 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.

Will the proposed project cause 1 acre or more of site disturbance?: (Yes) X (No)

- If Yes, applicant is responsible for any required Maine Construction General Permits and shall comply with the requirements of DEP Chapter 500 Stormwater Regulations, as they apply.

Signature of Applicant: _____

Date 2/13/24

Signature of Property Owner: _____

Date 2/13/24

DIGITAL SUBMITTAL REQUIREMENTS FOR ALL SUBMITTALS:

- A) PDF OF SIGNED APPLICATION
- B) PDFs OF ALL DRAWING SETS AND OTHER REQUIRED SUBMITTAL ATTACHMENTS NOTED ABOVE

HARD-COPY SUBMITTAL REQUIREMENTS FOR PLANNING BOARD APPLICATIONS:

- A) SEVEN (7) FULL-SIZE PAPER COPIES OF DRAWING SETS

DIGITAL SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) INDIVIDUALLY NAMED PDFs OF EACH DRAWING (NOT A COMBINED PDF SET)
 - Individual Drawing PDF Naming Format: 'PROJECT/SHEETSET NAME_INDIVIDUAL DRAWING NAME.pdf'
- B) PDF COPIES OF ALL PERMIT APPROVALS, APPLICATIONS, REPORTS, NARRATIVES, LETTERS, ETC.
- C) FINAL CAD REFERENCE FILES IN DWG FORMAT (SURVEY & PROPOSED DESIGN LINEWORK)
 - All drawings & CAD reference files must be to-scale and within the following coordinate systems:
 - MAINE STATE PLANE WEST NAD83 (Horizontal Datum) & NAVD88 (Vertical Datum)

HARD-COPY SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) THREE (3) FULL-SIZE PAPER COPIES OF INDIVIDUAL DRAWINGS REQUIRING BOARD SIGNATURE
- B) ONE (1) FULL-SIZE PAPER COPY OF ENTIRE DRAWING SET FOR ENGINEERING RECORDS

PLEASE CONFIRM WITH PLANNING STAFF FOR CLARIFICATION



UNIVERSITY OF
NEW ENGLAND

Biddeford Campus
11 Hills Beach Road
Biddeford, ME 04005
(207) 283-0171 T

Portland Campus
716 Stevens Avenue
Portland, ME 04103
(207) 797-7261 T

February 13, 2024

Mr. Tom Saucier
Site Design Associates
23 Whitney Way
Topsham, Maine 04086

TO WHOM IT MAY CONCERN:

This letter authorizes Tom Saucier, Site Design Associates, to serve as an agent for University of New England for the purpose of permitting proposed tennis courts on its Biddeford campus.

Sincerely,

A handwritten signature in black ink that reads "Alan Thibeault". The signature is written in a cursive style with a large, sweeping initial "A" and a stylized "T".

Alan Thibeault
Vice President for University Operations

CITY OF BIDDEFORD - SITE PLAN APPLICATION DRAWING CHECKLIST

LAST REVISED: 05/17/23

CHECKLIST DIRECTIONS:

- The following checklist must be completely filled out by the applicant for any Site Plan submitted to the Planning Department.
- Applicant to confirm all of the items listed are included within the submittal. Any missing items must have adequate reasoning to justify their absence.
- City to review applicant's submittal and checklist responses. Projects missing submittal information with non-acceptable reasoning will be rejected.
- Items in **BLACK** are required for 'Preliminary Site Plan' approval & 'Final Site Plan' approval.
- Items in **BLUE** are only required for 'Final Site Plan' approval.

SUBMITTAL INFORMATION - TO BE FILLED OUT BY APPLICANT	
Project Name:	Tennis Court Expansion
Planning Board # (if available):	
Applicant Name/Info:	University of New England, 11 Hills Beach Road, Biddeford, ME 04005
Submittal #/Type (Prelim/Final):	Preliminary
Submittal Date:	

SUBMITTAL REQUIREMENT		APPLICANT RESPONSE		CITY REVIEW RESPONSE	
ITEM NUMBER	DESCRIPTION	INFORMATION PROVIDED (YES/NO)	REASON NOT PROVIDED/COMMENT	ACCEPTABLE (YES/NO-REVISE & RESUBMIT)	COMMENT
1	GENERAL PLAN REQUIREMENTS				
	A Drawing specific legends (linetypes, hatches, etc.)	YES			
	B Individual drawing layer control should be utilized: freeze/thawing, changing lineweights, and screening (i.e. screen existing layers on a proposed plan, freeze topography and underground utilities on a proposed site plan)	YES			
	C North arrows, standard engineering scale viewports, dated revision blocks	YES			
	D All drawings and surveys must be in the following coordinate systems: NAD83 Maine State Plane West (Horizontal) and NAVD83 (Vertical)	YES			
	E Drawings need to be designed, signed & sealed by a Maine licensed professional engineer (PE); all boundary survey data needs to be performed by a licensed professional land surveyor (PLS)	YES			
2	COVER SHEET				
	A Project Name & Property Address	YES			
	B Project Team Contact Information (Owner, Engineer, Contractor, etc.)	YES			
	C Site Location Map	YES			
	D Sheet Set List of Drawings	YES			
	E Tax Map and Lot ID	YES			
	F Zoning & Shoreland Zone Information	YES			
	G Existing Use Description	YES			
	H Proposed Use Description	YES			
	I Required Waiver/Variations (Yes/No); if yes, plan must clearly list waivers/variances requesting	YES			
	J Name of Drainage Watershed	YES			
	K Within the M54 Urbanized Area (Yes/No)	NO			
	L Natural resources (streams, wetlands, etc.) located on-site or adjacent to the property (Yes/No)	YES			
	M Within the 100-year Flood Zone (Yes/No)	NO			
	N Public Road Proposed (Yes/No)	NO			
	O Private Road Proposed (Yes/No)	NO			
	P Public Sewer Connection (Yes/No); if yes, need to include a proposed sewer flow calculation per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	NA			
	Q Public Storm Drain Connection (Yes/No)	NO			
	R Limits of Disturbance in acres	YES			
	S Previous Land Cover square footage, existing and proposed	YES			
3	EXISTING CONDITIONS PLAN				
	A Horizontal & Vertical Datums annotated (NAD83 & NAVD83)	YES			
	B Survey Benchmark locations (with XYZ Coordinates annotated)	YES			
	C Property & Right-of-Way Lines	YES			
	D Boundary line information (bearings, distances, etc.)	YES			
	E Property pin and monumentation locations	YES			
	F Existing easements with proper ownership identified	NO	NOT APPLICABLE		
	G Road Names & Individual Lot Labels (Map, Lot, Owner, Acreage)	YES			
	H Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	YES			
	I 100-year Flood Zone Limits & Elevation	NO	NOT APPLICABLE		
	J USDA-NRCS Soil Boundaries and Labels	YES			
	K Existing contours with adequate contour labeling; minimum 1' contour interval	YES			
	L Existing building FFEs annotated	NO	NOT APPLICABLE		
	M Spot elevations for existing building corners, door entrances, accessible parking/walkways, road centerlines, and bottom/top of curbs	NO	NOT APPLICABLE		
	N Existing buildings & structures	NO	NOT APPLICABLE		
	O Existing pavement areas & number of parking spaces	YES			
	P Existing ADA ramp geometry, detectable warning plates, and ADA parking spaces	YES	NO PARKING ON SITE		
	Q Existing site features (sidewalks, retaining walls, curbing, lightpoles, guide rails, dumpsters, fencing)	YES			
	R Existing signage and striping	NO	NOT APPLICABLE		
	S Existing underground utility locations (storm, sewer, force main, water, gas, elec, tele)	YES			
	T Existing above-ground utility locations (manholes, catch basins, utility poles, hydrants, transformers, riprap)	YES			
	U Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	YES			
	V Existing tree lines, street trees, free-standing trees (12" or larger diameter at breast height), and vegetation	YES	TREES> 12" DBH NOT PROVIDED		

	F Clear annotation if proposed road will be public or private					
	G If Private Road is proposed, plans must clearly note that proposed private roads will not be submitted in the future for public acceptance					
	H If Private Road is proposed, plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads					
8	UTILITY PLAN					
	A Existing underground utility locations; screened (storm, sewer, force main, water, gas, electric, telecom)				YES	
	B Existing above-ground utility locations; screened (manholes, catch basins, utility poles, hydrants, riprap)				YES	
	C Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)				YES	
	D Proposed underground utility locations; bold (storm, sewer, force main, water, gas, electric, telecom, lighting)				YES	
	E Proposed above-ground utility locations; bold (manholes, catch basins, utility poles, hydrants, transformers, riprap)				YES	
	F Proposed storm culverts, outfalls, and riprap locations and sizes				YES	
	G Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)				YES	
	H Storm/sewer pipe labels must include: linear footage, pipe size, material, slope				YES	
	I Flow directional arrows for storm & sewer pipes				NA	
	J Proposed & existing site features shown that could conflict with proposed utilities (trees, signs, light-poles, bollards, foundations, guidrails)				YES	
	K All storm drains must be sized to convey the 25-year storm				YES	
	L Sewer force main sizes and invert elevations				NA	
	M Sewer pump station locations, model, rim, inverts, pipe sizes, cardinal directions (N, E, S, W)				NA	
	N Grease trap & oil-water separator locations, sizes, elevations				NA	
	O Water, gas, electric, and telecom sizes labelled				NA	
9	UTILITY PROFILES					
	A Utility profiles for all gravity storm drains and sewer pipes, including all laterals, catch basins, culverts, and outfalls; profiles preferred to be aligned on the pipe centerline (not superimposed on the road centerline)					
	B Existing surface: dashed and screened					
	C Proposed surface: continuous and bold					
	D Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)					
	E Storm/sewer pipe labels must include: linear footage, pipe size, material, slope					
	F Existing and proposed gravity pipe crossings shown; sizes labelled and depths/clearance annotated					
	G Existing and proposed electric/water/telecom/gas crossings shown at approximate depths, sizes labelled and depths/clearance annotated					
	H Known ledge or groundwater elevations					
	I For all storm drains, 25-year HGI must be shown on profiles with starting tailwater condition identified					
	J For storm outfalls, include riprap sling and grading extents					
	K Horizontal and vertical scale bars					
10	DETAILS					
	A Road section detail, including pavement & gravel depths				NO	NOT APPLICABLE
	B Sidewalk, paver, crosswalk, and any other pavement section details				YES	
	C Pavement sawcut detail				YES	
	D Utility trench/backfill detail				YES	
	E All site feature details; curbing, retaining walls, fencing, guidrails, dumpsters, etc.				YES	
	F Signage, striping, and ADA details				NO	NOT APPLICABLE
	G E&S notes and details; only show applicable/proposed measures				YES	
	H Utility structure details (manholes, cleanouts, fittings, handholes, transformer pads, hydrants)				YES	
	I Storm outfall & riprap details				YES	
	J Drainage ditch cross section identifying minimum depth, minimum bed width, and maximum side slopes				YES	
	K Pump station, grease trap, and oil-water separator details				NA	
	L Conduit section details				NA	
	M Miscellaneous details (as needed)				YES	
11	LANDSCAPING, LIGHTING & PHOTOMETRIC PLANS					
	A As required by ordinance; at a minimum: locations, counts, and species/models must be identified					
	B Landscaping & lighting details				YES	
12	DOCUMENTS/REPORTS/CALCULATIONS					
	A On initial preliminary submittal applications, applicant must submit a development review and inspection fee. Applicant to coordinate fee amount with City Planner prior to submittal. This fee will be drawn against to cover the following type of services throughout the project life cycle (and may require replenishing): i. 3rd Party City Peer-Review ii. Site Inspections during the permitting process iii. Erosion & Sediment Control Inspections during construction iv. Right-of-Way Inspections during construction v. Site Punchlist/As-Built Inspections post construction				YES	

B	Predevelopment & Post-development Drainage Area Maps, including: i. Subdrainage areas delineated and labeled ii. Points of Interest/Analysis shown and labeled iii. Hatching for different land cover areas (Impervious, pervious, gravel) iv. Time of concentration (Tc) paths & durations v. Four City-standardized stormwater summary tables	YES			
C	An approved "Sewer Ability-to-Serve Letter" from the Engineering Department: i. Applicant to submit proposed sewer flow calculations per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	NA			
D	A Performance Guarantee Cost Estimate utilizing Planning's template	NO			
E	For any Site Location of Development (SLODA) project, the applicant's submittal must mimic a formal submittal to DEP. Submittal must abide to DEP's SLODA application and include DEP's SLODA Submittal Checklist (Form D)	NO			HOPING A CONDITION OF APPROVAL UNTIL CONTRACTOR IS ON BOARD Project will proceed under exemption for educational institutions Title 38, Chapter 3: Such chapter 1, Article 6, 27.
F	25-year hydraulic calculations for all storm conveyance infrastructure (pipes, culverts, drainage ditches) via the rational method; starting tailwater conditions/documentation must be clearly identified				
G	If any SWM water quality BMP or detention facility is proposed, hydrologic model exports/hydrographs must be submitted for the for the 2, 10, 25, & 100-year storm frequencies				
H	Sizing calculations for any SWM water quality BMP or detention facility	YES			
I	A stormwater maintenance manual for any proposed SWM water quality BMP or detention facility, including: i. Annual maintenance requirements ii. Annual inspection requirements by a licensed PE; noting that all inspection reports/logs need to be submitted to the Engineering Department by March 1st each following year, identifying what on-going maintenance has occurred and what remedial repairs are needed iii. Signed Property Owner Agreement: including the current property owner's contact information and signature; it must be noted that all stormwater BMP maintenance requirements are linked to the property for perpetuity and transfer to any new ownership				
J	Salt Management Plan				
K	Sewer pump station sizing calculations				
L	Sewer pump station maintenance plan				
M	Grease trap sizing calculations				
N	Homeowner Association (HOA) agreement for any private road serving two (2) lots or more				
O	Summary list & copy of any required DOT/DEP/USACE permits & approvals				

Attachment 2
Site Location Map

**WERMENCHUK
PROPERTY
SR-1**

**UNE MAIN
CAMPUS
IN ZONE**

**UNE MAIN
CAMPUS
IN ZONE**

CR ZONE

**PROPOSED
PROJECT
SITE**

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SYTDesign CONSULTANTS, ANY ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SYTDesign CONSULTANTS.

Site Design Associates
Consulting Engineering & Land Planning

23 Whitney Way

Topsham, Maine 04086

Tel: (207) 449-4275

UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD, BIDDEFORD, ME

DESIGN TWS

DRAWN DEPT

CHKD TWS

DATE JULY 2015

SCALE 1" = 1000'

PROPOSED TENNIS COURTS
OLD POOL ROAD, BIDDEFORD, ME

SITE LOCATION MAP

PROJ.
NO.

DWG.
NO.

REV.

FIGURE 1

Attachment 3
Stormwater Management Report

STORMWATER MANAGEMENT REPORT

TENNIS COURT EXPANSION UNIVERSITY OF NEW ENGLAND 16 OLD POOL ROAD BIDDEFORD, MAINE

February 14, 2024

Introduction

Site Design Associates (SDA) was retained to assist the University of New England (UNE) (Applicant) in the design and permitting for the expansion of the existing outdoor tennis court facility at 16 Old Pool Road in Biddeford, Maine. The four existing tennis courts were constructed in 2017. The proposed project includes the construction of two additional tennis courts with bleachers and a press box and associated stormwater amenities. The project will result in an increase of 18,207 square feet of new impervious area and 22,979 square feet of new developed area.

This Stormwater Management Report assesses both pre-development and post-development peak runoff rates and stormwater treatment practices for the development area in accordance with the Maine DEP and City of Biddeford ordinance.

Methodology

The stormwater runoff analysis has been undertaken utilizing the HydroCAD Stormwater Modeling System software (Version 10.0) developed by the Applied Microcomputer Systems of Chocorua, New Hampshire. The program is based upon the TR-20 computer program and the TR-55 tabular method, both of which are based upon techniques developed by the USDA Soil Conservation Service. The analysis was undertaken for the 2, 10, 25, and 50-year frequencies (3.3, 4.9, 6.2, and 7.3 inches). Twenty-four hour storms with a Type III distribution were the basis for the analysis.

All storm drainage piping and stormwater treatment BMPs have been sized for the 25-year, 24-hour storm utilizing the HydroCAD program. Copies of the pre and post development HydroCAD output are included in Appendix A and Appendix B of this report, respectively.

Pre-Development Conditions

The site of the proposed project is located on a 25±-acre portion of the UNE campus at 16 Old Pool Road in Biddeford, Maine. The site is largely undeveloped, except for the four adjacent tennis courts constructed in 2017 and lawn areas. As taken from the website of the "*Natural Resources Conservation Service, United States Department of Agriculture, Web Soil Survey*," the predominant soil types in the development area are Naumburg sand (Na) (HSG A), Lyman loam (Ly) (HSG D), and Lyman rock outcrop (Ln) (HSG D). Due to the prevalence of wetlands and exposed and shallow ledge conditions in the Naumburg areas, HSG C was used for those soils. The USDA soil map

is included in Appendix D of this report. The soil boundaries are shown on drawings D-100, D-101, and D-200 in Appendix F of this report.

Stormwater runoff from the development area generally flows overland to the north into an unnamed tributary stream which flows to four existing 24-inch CMP culverts under Old Pool Road and ultimately flows to the tidal marsh adjacent to Biddeford Pool.

A city site plan application was submitted for the existing tennis courts in 2015. Based on the modeling and plans, both the DEP and city staff agreed that the flooding standard did not apply, due to the downstream improvements made by UNE and the fact that the drainage below the culverts is tidal.

Stormwater runoff from the existing tennis courts is treated in two 25-foot long stone berm level spreaders with wooded buffers on the north side of the courts.

Post-Development Conditions

The proposed project includes the construction of two additional tennis courts with bleachers and a press box and associated stormwater amenities. The project will result in an increase of 18,207 square feet of new impervious area and 22,979 square feet of new developed area.

Stormwater runoff from the new courts will be collected and treated in a grassed underdrained soil filter on the north side of the site. The new 6-foot wide paved walkway that will provide access to the new courts will drain to the existing stone berm level spreaders and buffers.

Stormwater Quantity

The project area is located within a partially developed 23± acre watershed (S4) draining to an unnamed stream which flows to four existing 24-inch CMP culverts under Old Pool Road just north of the project area. The Old Pool Road culverts were installed by UNE in 2006. In 2005 the abutter, Mr. Wermenchuk, was concerned that water was backing up behind the one 24" culvert that existed at the time. He indicated that when the Old Pool Road was paved at that time, he was of the understanding that a new, larger capacity culvert would be installed to prevent the water from backing up onto his property. His understanding was the city was going undertake this work in conjunction with the repaving project at the time. UNE was in the process of designing and permitting two parking lots in the watershed. Even though the designs met the stormwater runoff rate standards for those projects, UNE agreed to install improvements (with the city's blessing) to address Mr. Wermenchuk's perceived issue, to be a good neighbor and to put the issue rest. Because of limited head room, the decision was made to install three 24" diameter culverts adjacent to the existing 24" diameter culvert, rather than one large culvert.

The outlets of these culverts were used as the analysis point for the project (AP2). The analysis was undertaken utilizing the previous Maine DEP-approved 2006 drainage model for the installation of the new CMP culverts. Although there has been development within the campus since 2006, all projects have been required to meet the

Flooding Standard, so existing runoff values have remained the same. The additional impervious area associated the currently proposed tennis courts was added to the model to verify that existing peak flow rates were not exceeded. Due to the minimal size of the project in relation to the large S4 watershed, the minimal increase of impervious area associated with the two new tennis courts does not change the curve number for subcatchment S4. Therefore, peak flow rates remain the same at analysis point AP2.

TABLE 1 UNE TENNIS COURT EXPANSION - STORMWATER RUNOFF DISCHARGE SUMMARY				
ANALYSIS POINT	STORM FREQUENCY	EXISTING DISCHARGE (CFS)	PROPOSED DISCHARGE (CFS)	NOTES
AP3	Q ₂	41.1	41.1	No Increase
	Q ₁₀	80.7	80.7	No Increase
	Q ₂₅	99.8	99.8	No Increase
	Q ₅₀	155.9	155.9	No Increase

Stormwater Quality

The proposed project includes the construction of two additional tennis courts with bleachers and a press box and associated stormwater amenities. The project will result in an increase of 18,207 square feet of new impervious area and 22,979 square feet of new developed area.

Stormwater runoff from the new courts will be collected and treated in a grassed underdrained soil filter on the north side of the site. The new 6-foot wide paved walkway that will provide access to the new courts will drain to the existing stone berm level spreaders and buffers. Graded areas on the south and west sides of the courts and on the north side of the soil filter berm will be returned to a meadow condition and mowed no more than twice per year, thereby returning them to an undeveloped condition, per Maine DEP Chapter 500.

The project is designed based on the Maine DEP Chapter 500 General Standards requiring treatment of 95% of the new impervious area and 80% of the new developed area. The project will result in the treatment of 99.7% of the new impervious area and 93.2% of the new developed area.

BMP sizing for the soil filter and level spreaders are provided in Appendix C of this report.

Table 1 Water Quality Treatment Calculations				
Subcatchment Area	New Impervious	New Landscaped	New Developed	Treatment BMP
1	543	0	543	Level Spreader 1
2	687	0	687	Level Spreader 2
3	16,914	4,653	21,567	Soil Filter SF1
4	63	820	883	None
5	0	785	785	None
Subtotal Areas	18,207	6,258	24,465	
TOTAL TREATED AREAS	18,144	4,653	22,797	
PERCENT IMPERVIOUS & DEVELOPED AREA TREATED	99.7%		93.2%	
Notes: Treated Impervious Area Treated Developed Area Chapter 500 Requires treatment of 95% of impervious area and 80% of developed area. All areas presented in square feet.				

Erosion Control

BMPs such as a stabilized construction entrance, silt fence and/or filter berms of erosion control mix, riprap pipe inlet and outlet protection, mulch, and permanent seeding will be used to prevent erosion and downstream migration of sediment during construction. The locations of temporary and permanent erosion control measures and erosion and sedimentation control notes and details are shown on the design drawing set.

Inspection & Maintenance

The University of New England will be responsible for maintaining the stormwater facilities for the project. An Inspection and Maintenance Plan is included as Appendix D.

Conclusions

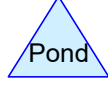
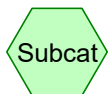
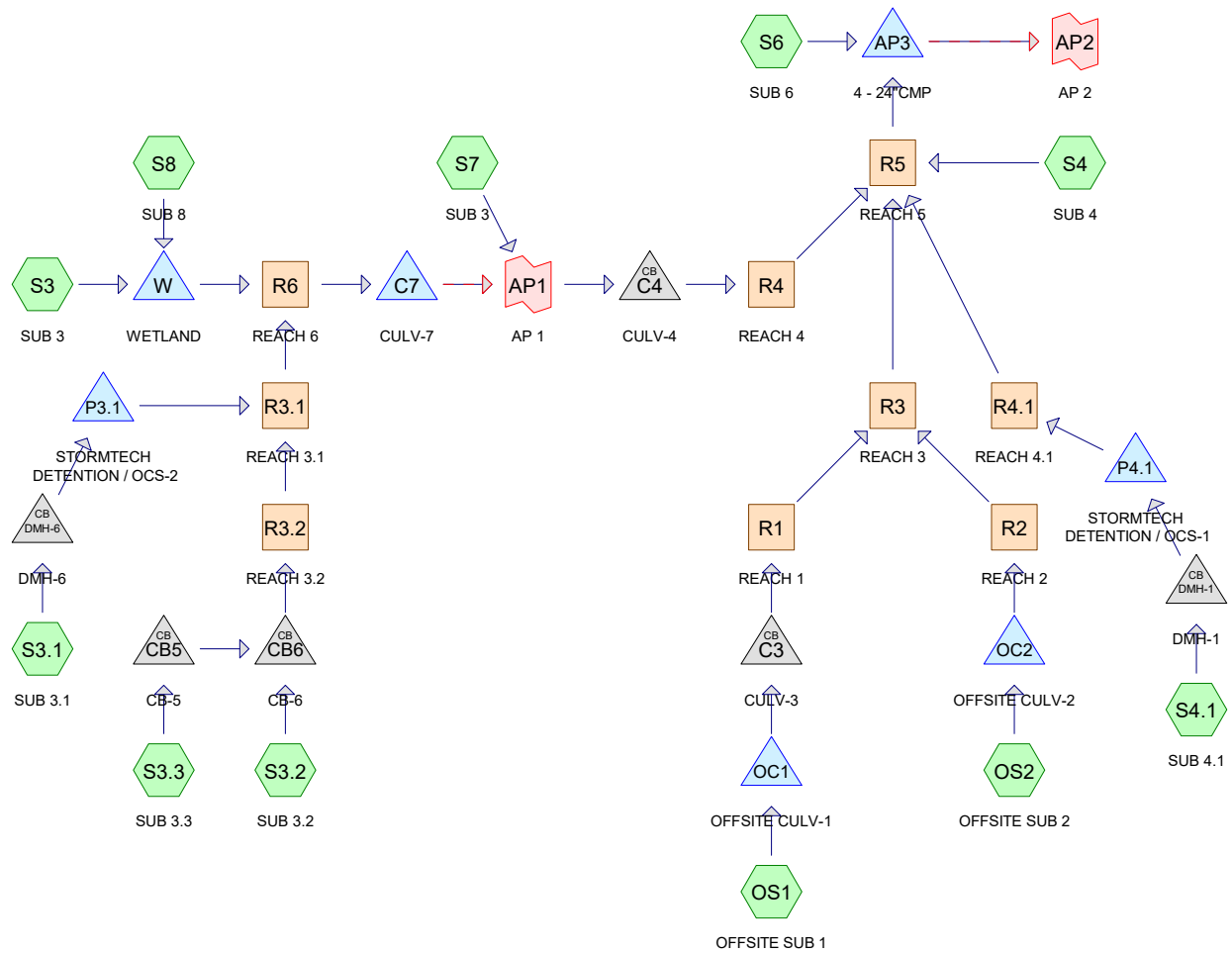
The stormwater management for this project includes a variety of BMPs to control both the quantity and quality of stormwater runoff. The HydroCAD calculations show that the project will maintain pre-development peak flows rates. Stormwater treatment BMPs have been designed to treat stormwater runoff from 99.7% of the new impervious area and 93.2% of the new developed area, which exceeds the standards of both the Maine DEP and the City of Biddeford. Based on the information provided, no adverse impacts to downstream receiving bodies are anticipated.

SUPPORTING DATA AND CALCULATIONS

The following material presents calculations and copies of source material used during the analysis for this study.

- Appendix A: Pre-Development HydroCAD Calculations
- Appendix B: Post-Development HydroCAD Calculations
- Appendix C: Stormwater BMP Calculations & Biddeford Stormwater Tables
- Appendix D: Inspection and Maintenance Plan
- Appendix E: USDA NRCS Soil Map
- Appendix F: Drainage Plans
 - D-100 – Campus Drainage Plan – Offsite Areas
 - D-101 – Campus Drainage Plan – Pre-Development
 - D-200 – Campus Drainage Plan – Post Development
 - D-300 – Stormwater Treatment Plan

Appendix A:
Pre Development Campus Drainage HydroCAD Caluclations



Routing Diagram for Campus - Pre Development
 Prepared by Site Design Associates, Printed 2/12/2024
 HydroCAD® 10.00-26 s/n 08018 © 2020 HydroCAD Software Solutions LLC

Campus - Pre Development

Prepared by Site Design Associates

HydroCAD® 10.00-26 s/n 08018 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 2-Yr Rainfall=3.30"

Printed 2/12/2024

Page 2

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment OS1: OFFSITE SUB 1 Runoff Area=1,467,784 sf 3.67% Impervious Runoff Depth=0.89"
Flow Length=1,645' Tc=29.1 min CN=70 Runoff=18.18 cfs 108,481 cf

Subcatchment OS2: OFFSITE SUB 2 Runoff Area=913,125 sf 2.70% Impervious Runoff Depth=1.28"
Flow Length=1,654' Tc=58.8 min CN=77 Runoff=12.15 cfs 97,685 cf

Subcatchment S3: SUB 3 Runoff Area=836,116 sf 36.42% Impervious Runoff Depth=1.16"
Flow Length=828' Tc=39.2 min CN=75 Runoff=12.49 cfs 80,978 cf

Subcatchment S3.1: SUB 3.1 Runoff Area=41,451 sf 89.14% Impervious Runoff Depth=2.85"
Flow Length=160' Slope=0.0100 ' ' Tc=5.0 min CN=96 Runoff=3.06 cfs 9,837 cf

Subcatchment S3.2: SUB 3.2 Runoff Area=8,722 sf 9.15% Impervious Runoff Depth=1.55"
Flow Length=163' Slope=0.0220 ' ' Tc=5.0 min CN=81 Runoff=0.37 cfs 1,125 cf

Subcatchment S3.3: SUB 3.3 Runoff Area=1,672 sf 27.51% Impervious Runoff Depth=1.35"
Tc=5.0 min CN=78 Runoff=0.06 cfs 188 cf

Subcatchment S4: SUB 4 Runoff Area=1,012,128 sf 16.94% Impervious Runoff Depth=1.48"
Flow Length=1,599' Tc=46.2 min CN=80 Runoff=18.17 cfs 124,765 cf

Subcatchment S4.1: SUB 4.1 Runoff Area=36,714 sf 95.49% Impervious Runoff Depth=2.96"
Flow Length=281' Slope=0.0100 ' ' Tc=5.0 min CN=97 Runoff=2.76 cfs 9,043 cf

Subcatchment S6: SUB 6 Runoff Area=132,680 sf 8.16% Impervious Runoff Depth=1.55"
Flow Length=616' Tc=13.5 min CN=81 Runoff=4.32 cfs 17,117 cf

Subcatchment S7: SUB 3 Runoff Area=167,053 sf 43.24% Impervious Runoff Depth=2.17"
Flow Length=1,081' Tc=10.0 min CN=89 Runoff=8.48 cfs 30,251 cf

Subcatchment S8: SUB 8 Runoff Area=81,849 sf 5.04% Impervious Runoff Depth=1.35"
Flow Length=399' Tc=21.1 min CN=78 Runoff=1.92 cfs 9,188 cf

Reach R1: REACH 1 Avg. Flow Depth=0.19' Max Vel=1.26 fps Inflow=6.83 cfs 108,474 cf
n=0.030 L=386.0' S=0.0104 ' ' Capacity=256.49 cfs Outflow=6.82 cfs 108,472 cf

Reach R2: REACH 2 Avg. Flow Depth=0.23' Max Vel=1.40 fps Inflow=10.07 cfs 97,680 cf
n=0.030 L=527.0' S=0.0100 ' ' Capacity=252.44 cfs Outflow=10.00 cfs 97,679 cf

Reach R3: REACH 3 Avg. Flow Depth=0.62' Max Vel=3.73 fps Inflow=16.80 cfs 206,151 cf
n=0.030 L=874.0' S=0.0138 ' ' Capacity=141.56 cfs Outflow=16.76 cfs 206,149 cf

Reach R3.1: REACH 3.1 Avg. Flow Depth=0.03' Max Vel=0.41 fps Inflow=0.60 cfs 11,150 cf
n=0.025 L=179.0' S=0.0056 ' ' Capacity=833.80 cfs Outflow=0.53 cfs 11,150 cf

Reach R3.2: REACH 3.2 Avg. Flow Depth=0.01' Max Vel=0.65 fps Inflow=0.44 cfs 1,313 cf
n=0.025 L=91.3' S=0.0219 ' ' Capacity=1,651.08 cfs Outflow=0.40 cfs 1,313 cf

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Reach R4: REACH 4	Avg. Flow Depth=0.57' Max Vel=3.95 fps Inflow=16.14 cfs 131,567 cf n=0.030 L=144.0' S=0.0171 '/' Capacity=157.25 cfs Outflow=16.14 cfs 131,567 cf
Reach R4.1: REACH 4.1	Avg. Flow Depth=0.07' Max Vel=0.99 fps Inflow=0.89 cfs 9,043 cf n=0.030 L=552.0' S=0.0145 '/' Capacity=390.71 cfs Outflow=0.87 cfs 9,043 cf
Reach R5: REACH 5	Avg. Flow Depth=1.01' Max Vel=5.67 fps Inflow=40.35 cfs 471,523 cf n=0.025 L=317.0' S=0.0134 '/' Capacity=147.04 cfs Outflow=40.33 cfs 471,523 cf
Reach R6: REACH 6	Avg. Flow Depth=0.21' Max Vel=3.78 fps Inflow=14.12 cfs 101,316 cf n=0.025 L=133.0' S=0.0328 '/' Capacity=623.19 cfs Outflow=14.12 cfs 101,316 cf
Pond AP3: 4 - 24"CMP	Peak Elev=11.78' Storage=4,214 cf Inflow=41.18 cfs 488,639 cf Primary=41.09 cfs 488,616 cf Secondary=0.00 cfs 0 cf Outflow=41.09 cfs 488,616 cf
Pond C3: CULV-3	Peak Elev=32.83' Inflow=6.83 cfs 108,474 cf 24.0" Round Culvert n=0.013 L=169.0' S=0.0095 '/' Outflow=6.83 cfs 108,474 cf
Pond C4: CULV-4	Peak Elev=18.95' Inflow=16.14 cfs 131,567 cf 24.0" Round Culvert n=0.011 L=86.0' S=0.0050 '/' Outflow=16.14 cfs 131,567 cf
Pond C7: CULV-7	Peak Elev=21.02' Storage=569 cf Inflow=14.12 cfs 101,316 cf Primary=14.10 cfs 101,316 cf Secondary=0.00 cfs 0 cf Outflow=14.10 cfs 101,316 cf
Pond CB5: CB-5	Peak Elev=104.12' Inflow=0.06 cfs 188 cf 1.0" Round Culvert n=0.010 L=70.0' S=0.0050 '/' Outflow=0.06 cfs 188 cf
Pond CB6: CB-6	Peak Elev=28.20' Inflow=0.44 cfs 1,313 cf 12.0" Round Culvert n=0.013 L=184.0' S=0.0050 '/' Outflow=0.44 cfs 1,313 cf
Pond DMH-1: DMH-1	Peak Elev=33.33' Inflow=2.76 cfs 9,043 cf 24.0" Round Culvert n=0.010 L=30.0' S=0.0077 '/' Outflow=2.76 cfs 9,043 cf
Pond DMH-6: DMH-6	Peak Elev=30.87' Inflow=3.06 cfs 9,837 cf 24.0" Round Culvert n=0.010 L=6.0' S=0.2050 '/' Outflow=3.06 cfs 9,837 cf
Pond OC1: OFFSITE CULV-1	Peak Elev=35.42' Storage=30,746 cf Inflow=18.18 cfs 108,481 cf 18.0" Round Culvert n=0.013 L=97.6' S=0.0201 '/' Outflow=6.83 cfs 108,474 cf
Pond OC2: OFFSITE CULV-2	Peak Elev=34.53' Storage=12,480 cf Inflow=12.15 cfs 97,685 cf 18.0" Round Culvert n=0.013 L=93.6' S=0.0170 '/' Outflow=10.07 cfs 97,680 cf
Pond P3.1: STORMTECH DETENTION / OCS-2	Peak Elev=29.36' Storage=3,885 cf Inflow=3.06 cfs 9,837 cf Outflow=0.32 cfs 9,837 cf
Pond P4.1: STORMTECH DETENTION / OCS-1	Peak Elev=33.01' Storage=1,451 cf Inflow=2.76 cfs 9,043 cf Outflow=0.89 cfs 9,043 cf
Pond W: WETLAND	Peak Elev=24.29' Storage=1,005 cf Inflow=13.72 cfs 90,166 cf Outflow=13.67 cfs 90,166 cf

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Type III 24-hr 2-Yr Rainfall=3.30"

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Link AP1: AP 1

Inflow=16.14 cfs 131,567 cf

Primary=16.14 cfs 131,567 cf

Link AP2: AP 2

Inflow=41.09 cfs 488,616 cf

Primary=41.09 cfs 488,616 cf

Total Runoff Area = 4,699,294 sf Runoff Volume = 488,659 cf Average Runoff Depth = 1.25"
84.79% Pervious = 3,984,423 sf 15.21% Impervious = 714,871 sf

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Type III 24-hr 2-Yr Rainfall=3.30"

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Summary for Subcatchment OS1: OFFSITE SUB 1

Runoff = 18.18 cfs @ 12.45 hrs, Volume= 108,481 cf, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
53,844	98	Paved parking & roofs
32,748	49	50-75% Grass cover, Fair, HSG A
12,803	79	50-75% Grass cover, Fair, HSG C
12,554	84	50-75% Grass cover, Fair, HSG D
205,440	30	Woods, Good, HSG A
228,765	70	Woods, Good, HSG C
921,630	77	Woods, Good, HSG D
1,467,784	70	Weighted Average
1,413,940		96.33% Pervious Area
53,844		3.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0430	0.25		Sheet Flow, A - B
					Range n= 0.130 P2= 3.00"
0.8	75	0.0510	1.58		Shallow Concentrated Flow, B -C
					Short Grass Pasture Kv= 7.0 fps
20.3	923	0.0230	0.76		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
1.4	547	0.0180	6.31	157.83	Channel Flow, D - E
					Area= 25.0 sf Perim= 27.0' r= 0.93'
					n= 0.030 Earth, grassed & winding
29.1	1,645	Total			

Summary for Subcatchment OS2: OFFSITE SUB 2

Runoff = 12.15 cfs @ 12.86 hrs, Volume= 97,685 cf, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
24,623	98	Paved parking & roofs
8,226	79	50-75% Grass cover, Fair, HSG C
13,667	84	50-75% Grass cover, Fair, HSG D
151,095	70	Woods, Good, HSG C
715,514	77	Woods, Good, HSG D
913,125	77	Weighted Average
888,502		97.30% Pervious Area
24,623		2.70% Impervious Area

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Type III 24-hr 2-Yr Rainfall=3.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0530	0.11		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
43.8	1,554	0.0140	0.59		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
58.8	1,654	Total			

Summary for Subcatchment S3: SUB 3

Runoff = 12.49 cfs @ 12.59 hrs, Volume= 80,978 cf, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
304,505	98	Paved parking & roofs
45,477	49	50-75% Grass cover, Fair, HSG A
10,125	79	50-75% Grass cover, Fair, HSG C
78,239	84	50-75% Grass cover, Fair, HSG D
142,893	30	Woods, Good, HSG A
81,209	70	Woods, Good, HSG C
173,668	77	Woods, Good, HSG D
836,116	75	Weighted Average
531,611		63.58% Pervious Area
304,505		36.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.0950	0.15		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.5	143	0.1000	1.58		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
21.3	535	0.0070	0.42		Shallow Concentrated Flow, C -D
					Woodland Kv= 5.0 fps
39.2	828	Total			

Summary for Subcatchment S3.1: SUB 3.1

Runoff = 3.06 cfs @ 12.07 hrs, Volume= 9,837 cf, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

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Type III 24-hr 2-Yr Rainfall=3.30"

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Area (sf)	CN	Description
36,951	98	Paved parking & roofs
3,700	79	50-75% Grass cover, Fair, HSG C
800	84	50-75% Grass cover, Fair, HSG D
41,451	96	Weighted Average
4,500		10.86% Pervious Area
36,951		89.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	160	0.0100	1.11		Sheet Flow, A - B
					Smooth surfaces n= 0.011 P2= 3.00"
2.6					Direct Entry, Min Tc
5.0	160	Total			

Summary for Subcatchment S3.2: SUB 3.2

Runoff = 0.37 cfs @ 12.08 hrs, Volume= 1,125 cf, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
798	98	Paved parking & roofs
7,924	79	50-75% Grass cover, Fair, HSG C
8,722	81	Weighted Average
7,924		90.85% Pervious Area
798		9.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	163	0.0220	1.04		Shallow Concentrated Flow, A - B
					Short Grass Pasture Kv= 7.0 fps
2.4					Direct Entry,
5.0	163	Total			

Summary for Subcatchment S3.3: SUB 3.3

Runoff = 0.06 cfs @ 12.08 hrs, Volume= 188 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
460	98	Paved parking & roofs
1,212	70	Woods, Good, HSG C
1,672	78	Weighted Average
1,212		72.49% Pervious Area
460		27.51% Impervious Area

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Type III 24-hr 2-Yr Rainfall=3.30"

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

Summary for Subcatchment S4: SUB 4

Runoff = 18.17 cfs @ 12.67 hrs, Volume= 124,765 cf, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
171,450	98	Paved parking & roofs
20,781	79	50-75% Grass cover, Fair, HSG C
7,642	84	50-75% Grass cover, Fair, HSG D
419,188	73	Woods, Fair, HSG C
393,067	79	Woods, Fair, HSG D
1,012,128	80	Weighted Average
840,678		83.06% Pervious Area
171,450		16.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.3	100	0.0100	0.06		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.9	284	0.0600	1.22		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
10.4	341	0.0120	0.55		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
2.6	874	0.0140	5.64	281.88	Channel Flow, D - E
					Area= 50.0 sf Perim= 53.0' r= 0.94'
					n= 0.030 Earth, grassed & winding
46.2	1,599	Total			

Summary for Subcatchment S4.1: SUB 4.1

Runoff = 2.76 cfs @ 12.07 hrs, Volume= 9,043 cf, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
35,058	98	Paved parking & roofs
1,656	74	>75% Grass cover, Good, HSG C
36,714	97	Weighted Average
1,656		4.51% Pervious Area
35,058		95.49% Impervious Area

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Type III 24-hr 2-Yr Rainfall=3.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	200	0.0100	1.16		Sheet Flow, A - B Smooth surfaces n= 0.011 P2= 3.00"
0.7	81	0.0100	2.03		Shallow Concentrated Flow, B - C Paved Kv= 20.3 fps
1.4					Direct Entry, Min Tc
5.0	281	Total			

Summary for Subcatchment S6: SUB 6

Runoff = 4.32 cfs @ 12.19 hrs, Volume= 17,117 cf, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
10,824	98	Paved parking & roofs
19,401	79	50-75% Grass cover, Fair, HSG C
64,092	84	50-75% Grass cover, Fair, HSG D
32,603	70	Woods, Good, HSG C
5,760	77	Woods, Good, HSG D
132,680	81	Weighted Average
121,856		91.84% Pervious Area
10,824		8.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	40	0.0410	0.08		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	71	0.1120	1.67		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
4.5	265	0.0380	0.97		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
0.3	240	0.0250	11.44	686.23	Channel Flow, C - D Area= 60.0 sf Perim= 34.0' r= 1.76' n= 0.030 Earth, grassed & winding
13.5	616	Total			

Summary for Subcatchment S7: SUB 3

Runoff = 8.48 cfs @ 12.14 hrs, Volume= 30,251 cf, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

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Type III 24-hr 2-Yr Rainfall=3.30"

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Area (sf)	CN	Description
72,236	98	Paved parking & roofs
66,092	84	50-75% Grass cover, Fair, HSG D
5,176	73	Woods, Fair, HSG C
23,549	79	Woods, Fair, HSG D
167,053	89	Weighted Average
94,817		56.76% Pervious Area
72,236		43.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	58	0.0430	0.20		Sheet Flow, A - B Grass: Short n= 0.150 P2= 3.00"
1.1	136	0.0840	2.03		Shallow Concentrated Flow, B - C Short Grass Pasture Kv= 7.0 fps
2.8	424	0.0150	2.49		Shallow Concentrated Flow, C - D Paved Kv= 20.3 fps
0.1	39	0.0450	9.55	3.33	Pipe Channel, D - E 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
0.3	185	0.0380	11.66	116.60	Channel Flow, E - F Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.5	137	0.0168	4.82	0.95	Pipe Channel, F - G 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
0.4	102	0.0042	4.67	14.66	Pipe Channel, G - H 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
10.0	1,081	Total			

Summary for Subcatchment S8: SUB 8

Runoff = 1.92 cfs @ 12.31 hrs, Volume= 9,188 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
4,122	98	Paved parking & roofs
439	79	50-75% Grass cover, Fair, HSG C
34,658	74	>75% Grass cover, Good, HSG C
4,166	73	Woods, Fair, HSG C
38,464	79	Woods, Fair, HSG D
81,849	78	Weighted Average
77,727		94.96% Pervious Area
4,122		5.04% Impervious Area

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Type III 24-hr 2-Yr Rainfall=3.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	120	0.0500	0.11		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
1.4	138	0.1100	1.66		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
1.9	141	0.0320	1.25		Shallow Concentrated Flow, C - D Short Grass Pasture Kv= 7.0 fps
21.1	399	Total			

Summary for Reach R1: REACH 1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 0.89" for 2-Yr event
 Inflow = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf
 Outflow = 6.82 cfs @ 13.21 hrs, Volume= 108,472 cf, Atten= 0%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.26 fps, Min. Travel Time= 5.1 min
 Avg. Velocity= 0.44 fps, Avg. Travel Time= 14.7 min

Peak Storage= 2,088 cf @ 13.13 hrs
 Average Depth at Peak Storage= 0.19'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 256.49 cfs

100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
 Length= 386.0' Slope= 0.0104 '/'
 Inlet Invert= 30.00', Outlet Invert= 26.00'

**Summary for Reach R2: REACH 2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 1.28" for 2-Yr event
 Inflow = 10.07 cfs @ 13.13 hrs, Volume= 97,680 cf
 Outflow = 10.00 cfs @ 13.31 hrs, Volume= 97,679 cf, Atten= 1%, Lag= 10.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.40 fps, Min. Travel Time= 6.3 min
 Avg. Velocity= 0.40 fps, Avg. Travel Time= 21.9 min

Peak Storage= 3,757 cf @ 13.21 hrs
 Average Depth at Peak Storage= 0.23'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 252.44 cfs

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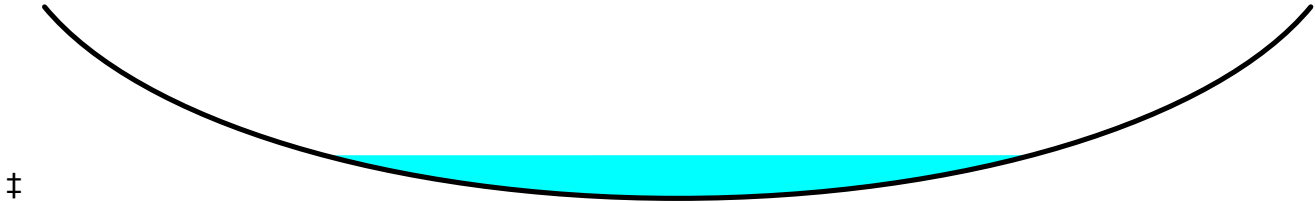
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100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 527.0' Slope= 0.0100 '/'
Inlet Invert= 31.29', Outlet Invert= 26.00'



Summary for Reach R3: REACH 3

Inflow Area = 2,380,909 sf, 3.30% Impervious, Inflow Depth = 1.04" for 2-Yr event
Inflow = 16.80 cfs @ 13.29 hrs, Volume= 206,151 cf
Outflow = 16.76 cfs @ 13.40 hrs, Volume= 206,149 cf, Atten= 0%, Lag= 6.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.73 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 1.06 fps, Avg. Travel Time= 13.8 min

Peak Storage= 3,928 cf @ 13.34 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 141.56 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 874.0' Slope= 0.0138 '/'
Inlet Invert= 26.00', Outlet Invert= 13.90'



Summary for Reach R3.1: REACH 3.1

Inflow Area = 51,845 sf, 73.70% Impervious, Inflow Depth = 2.58" for 2-Yr event
Inflow = 0.60 cfs @ 12.15 hrs, Volume= 11,150 cf
Outflow = 0.53 cfs @ 12.34 hrs, Volume= 11,150 cf, Atten= 11%, Lag= 11.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.41 fps, Min. Travel Time= 7.2 min
Avg. Velocity = 0.33 fps, Avg. Travel Time= 9.1 min

Peak Storage= 232 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 833.80 cfs

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50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 179.0' Slope= 0.0056 '/'
Inlet Invert= 24.90', Outlet Invert= 23.90'



Summary for Reach R3.2: REACH 3.2

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 1.52" for 2-Yr event
Inflow = 0.44 cfs @ 12.08 hrs, Volume= 1,313 cf
Outflow = 0.40 cfs @ 12.15 hrs, Volume= 1,313 cf, Atten= 9%, Lag= 4.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.65 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 2.4 min

Peak Storage= 56 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.01'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 1,651.08 cfs

50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 91.3' Slope= 0.0219 '/'
Inlet Invert= 26.90', Outlet Invert= 24.90'



Summary for Reach R4: REACH 4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 1.39" for 2-Yr event
Inflow = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf
Outflow = 16.14 cfs @ 12.55 hrs, Volume= 131,567 cf, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.95 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 1.8 min

Peak Storage= 588 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 157.25 cfs

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6.00' x 2.00' deep channel, $n = 0.030$ Stream, clean & straight
Side Slope Z-value= 2.0 ' ' Top Width= 14.00'
Length= 144.0' Slope= 0.0171 ' '
Inlet Invert= 16.36', Outlet Invert= 13.90'



Summary for Reach R4.1: REACH 4.1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 2.96" for 2-Yr event
Inflow = 0.89 cfs @ 12.35 hrs, Volume= 9,043 cf
Outflow = 0.87 cfs @ 12.59 hrs, Volume= 9,043 cf, Atten= 2%, Lag= 14.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.99 fps, Min. Travel Time= 9.3 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 19.1 min

Peak Storage= 485 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 2.00' Flow Area= 56.0 sf, Capacity= 390.71 cfs

12.00' x 2.00' deep channel, $n = 0.030$ Earth, grassed & winding
Side Slope Z-value= 8.0 ' ' Top Width= 44.00'
Length= 552.0' Slope= 0.0145 ' '
Inlet Invert= 22.00', Outlet Invert= 14.00'



Summary for Reach R5: REACH 5

Inflow Area = 4,566,614 sf, 15.42% Impervious, Inflow Depth = 1.24" for 2-Yr event
Inflow = 40.35 cfs @ 12.78 hrs, Volume= 471,523 cf
Outflow = 40.33 cfs @ 12.80 hrs, Volume= 471,523 cf, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.67 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 3.7 min

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Peak Storage= 2,255 cf @ 12.78 hrs

Average Depth at Peak Storage= 1.01'

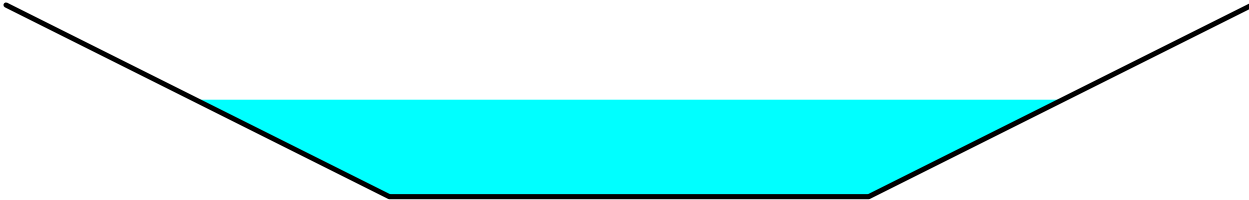
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 147.04 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 13.00'

Length= 317.0' Slope= 0.0134 ' '

Inlet Invert= 13.90', Outlet Invert= 9.64'



Summary for Reach R6: REACH 6

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 1.25" for 2-Yr event

Inflow = 14.12 cfs @ 12.59 hrs, Volume= 101,316 cf

Outflow = 14.12 cfs @ 12.61 hrs, Volume= 101,316 cf, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 3.78 fps, Min. Travel Time= 0.6 min

Avg. Velocity = 1.25 fps, Avg. Travel Time= 1.8 min

Peak Storage= 497 cf @ 12.60 hrs

Average Depth at Peak Storage= 0.21'

Bank-Full Depth= 2.00' Flow Area= 42.0 sf, Capacity= 623.19 cfs

17.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 2.0 ' ' Top Width= 25.00'

Length= 133.0' Slope= 0.0328 ' '

Inlet Invert= 23.90', Outlet Invert= 19.54'



Summary for Pond AP3: 4 - 24" CMP

Inflow Area = 4,699,294 sf, 15.21% Impervious, Inflow Depth = 1.25" for 2-Yr event

Inflow = 41.18 cfs @ 12.79 hrs, Volume= 488,639 cf

Outflow = 41.09 cfs @ 12.82 hrs, Volume= 488,616 cf, Atten= 0%, Lag= 1.8 min

Primary = 41.09 cfs @ 12.82 hrs, Volume= 488,616 cf

Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 6

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Peak Elev= 11.78' @ 12.82 hrs Surf.Area= 3,694 sf Storage= 4,214 cf

Plug-Flow detention time= 2.0 min calculated for 488,616 cf (100% of inflow)

Center-of-Mass det. time= 1.9 min (919.9 - 918.1)

Volume	Invert	Avail.Storage	Storage Description
#1	9.64'	96,037 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.64	0	0	0
10.00	856	154	154
12.00	4,037	4,893	5,047
14.00	13,588	17,625	22,672
16.00	39,016	52,604	75,276
16.50	44,026	20,761	96,037

Device	Routing	Invert	Outlet Devices
#1	Primary	9.77'	24.0" Round Proposed 3 - 24" CMP X 3.00 L= 65.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.12' S= 0.0100 ' / Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Primary	9.83'	24.0" Round Existing 24" CMP L= 64.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.83' S= -0.0009 ' / Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#3	Secondary	16.50'	20.0' long x 25.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=41.09 cfs @ 12.82 hrs HW=11.78' (Free Discharge)↑ **1=Proposed 3 - 24" CMP** (Barrel Controls 33.65 cfs @ 4.41 fps)↑ **2=Existing 24" CMP** (Barrel Controls 7.45 cfs @ 2.92 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=9.64' (Free Discharge)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond C3: CULV-3**

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 0.89" for 2-Yr event
 Inflow = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf
 Outflow = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf, Atten= 0%, Lag= 0.0 min
 Primary = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 32.83' @ 13.06 hrs

Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.60'	24.0" Round Culvert L= 169.0' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 31.60' / 30.00' S= 0.0095 ' /' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 3.14 sf

Primary OutFlow Max=6.83 cfs @ 13.06 hrs HW=32.83' TW=31.60' (Fixed TW Elev= 31.60')

↑**1=Culvert** (Outlet Controls 6.83 cfs @ 4.80 fps)

Summary for Pond C4: CULV-4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 1.39" for 2-Yr event
 Inflow = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf
 Outflow = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf, Atten= 0%, Lag= 0.0 min
 Primary = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 18.95' @ 12.54 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.79'	24.0" Round Culvert L= 86.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 16.79' / 16.36' S= 0.0050 ' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=16.14 cfs @ 12.54 hrs HW=18.95' (Free Discharge)

↑**1=Culvert** (Barrel Controls 16.14 cfs @ 5.91 fps)

Summary for Pond C7: CULV-7

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 1.25" for 2-Yr event
 Inflow = 14.12 cfs @ 12.61 hrs, Volume= 101,316 cf
 Outflow = 14.10 cfs @ 12.62 hrs, Volume= 101,316 cf, Atten= 0%, Lag= 0.9 min
 Primary = 14.10 cfs @ 12.62 hrs, Volume= 101,316 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 21.02' @ 12.62 hrs Surf.Area= 914 sf Storage= 569 cf

Plug-Flow detention time= 0.5 min calculated for 101,316 cf (100% of inflow)
 Center-of-Mass det. time= 0.4 min (891.5 - 891.1)

Volume	Invert	Avail.Storage	Storage Description
#1	19.54'	9,728 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.54	0	0	0
20.00	144	33	33
21.00	890	517	550
22.00	2,015	1,453	2,003
23.00	6,588	4,302	6,304
23.50	7,106	3,424	9,728

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Device	Routing	Invert	Outlet Devices
#1	Primary	19.54'	24.0" Round 24" RCP L= 184.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 19.54' / 16.79' S= 0.0149 ' S= 0.0149 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	23.40'	250.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=14.10 cfs @ 12.62 hrs HW=21.02' (Free Discharge)

↑1=24" RCP (Inlet Controls 14.10 cfs @ 5.65 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.54' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond CB5: CB-5

Inflow Area = 1,672 sf, 27.51% Impervious, Inflow Depth = 1.35" for 2-Yr event
 Inflow = 0.06 cfs @ 12.08 hrs, Volume= 188 cf
 Outflow = 0.06 cfs @ 12.08 hrs, Volume= 188 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.06 cfs @ 12.08 hrs, Volume= 188 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 104.12' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	29.50'	1.0" Round 12" CULV L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.50' / 29.15' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.01 sf

Primary OutFlow Max=0.06 cfs @ 12.08 hrs HW=103.97' (Free Discharge)

↑1=12" CULV (Barrel Controls 0.06 cfs @ 11.31 fps)

Summary for Pond CB6: CB-6

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 1.52" for 2-Yr event
 Inflow = 0.44 cfs @ 12.08 hrs, Volume= 1,313 cf
 Outflow = 0.44 cfs @ 12.08 hrs, Volume= 1,313 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.44 cfs @ 12.08 hrs, Volume= 1,313 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 28.20' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.82'	12.0" Round 12"SD L= 184.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 27.82' / 26.90' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 0.79 sf

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Primary OutFlow Max=0.44 cfs @ 12.08 hrs HW=28.20' (Free Discharge)

↑1=12"SD (Barrel Controls 0.44 cfs @ 2.39 fps)

Summary for Pond DMH-1: DMH-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 2.96" for 2-Yr event
 Inflow = 2.76 cfs @ 12.07 hrs, Volume= 9,043 cf
 Outflow = 2.76 cfs @ 12.07 hrs, Volume= 9,043 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.76 cfs @ 12.07 hrs, Volume= 9,043 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.33' @ 12.07 hrs

Flood Elev= 36.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.58'	24.0" Round 24" SD to Detention Bed L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 32.58' / 32.35' S= 0.0077 ' S= 0.0077 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.76 cfs @ 12.07 hrs HW=33.33' (Free Discharge)

↑1=24" SD to Detention Bed (Barrel Controls 2.76 cfs @ 3.77 fps)

Summary for Pond DMH-6: DMH-6

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 2.85" for 2-Yr event
 Inflow = 3.06 cfs @ 12.07 hrs, Volume= 9,837 cf
 Outflow = 3.06 cfs @ 12.07 hrs, Volume= 9,837 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.06 cfs @ 12.07 hrs, Volume= 9,837 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 30.87' @ 12.07 hrs

Flood Elev= 32.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	30.13'	24.0" Round 24" SD to Detention Bed L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 30.13' / 28.90' S= 0.2050 ' S= 0.2050 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.06 cfs @ 12.07 hrs HW=30.86' (Free Discharge)

↑1=24" SD to Detention Bed (Inlet Controls 3.06 cfs @ 2.92 fps)

Summary for Pond OC1: OFFSITE CULV-1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 0.89" for 2-Yr event
 Inflow = 18.18 cfs @ 12.45 hrs, Volume= 108,481 cf
 Outflow = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf, Atten= 62%, Lag= 36.5 min
 Primary = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf

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Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 35.42' @ 13.06 hrs Surf.Area= 47,126 sf Storage= 30,746 cf

Plug-Flow detention time= 76.7 min calculated for 108,451 cf (100% of inflow)
 Center-of-Mass det. time= 76.9 min (971.8 - 894.9)

Volume	Invert	Avail.Storage	Storage Description
#1	34.25'	602,689 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.25	5,289	0	0
36.00	67,698	63,864	63,864
38.00	137,090	204,788	268,652
40.00	196,947	334,037	602,689

Device	Routing	Invert	Outlet Devices
#1	Primary	34.25'	18.0" Round 18" RCP L= 97.6' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 34.25' / 32.29' S= 0.0201 ' S= 0.0201 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=6.84 cfs @ 13.06 hrs HW=35.42' (Free Discharge)
 ↑**1=18" RCP** (Inlet Controls 6.84 cfs @ 4.61 fps)

Summary for Pond OC2: OFFSITE CULV-2

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 1.28" for 2-Yr event
 Inflow = 12.15 cfs @ 12.86 hrs, Volume= 97,685 cf
 Outflow = 10.07 cfs @ 13.13 hrs, Volume= 97,680 cf, Atten= 17%, Lag= 16.1 min
 Primary = 10.07 cfs @ 13.13 hrs, Volume= 97,680 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 34.53' @ 13.13 hrs Surf.Area= 9,538 sf Storage= 12,480 cf

Plug-Flow detention time= 29.4 min calculated for 97,680 cf (100% of inflow)
 Center-of-Mass det. time= 29.4 min (929.0 - 899.6)

Volume	Invert	Avail.Storage	Storage Description
#1	32.88'	71,548 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.88	5,285	0	0
34.00	8,520	7,731	7,731
36.00	12,392	20,912	28,643
38.00	30,513	42,905	71,548

Device	Routing	Invert	Outlet Devices
#1	Primary	32.88'	18.0" Round 18" RCP L= 93.6' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 32.88' / 31.29' S= 0.0170 ' / ' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=10.07 cfs @ 13.13 hrs HW=34.53' (Free Discharge)

↑1=18" RCP (Inlet Controls 10.07 cfs @ 5.70 fps)

Summary for Pond P3.1: STORMTECH DETENTION / OCS-2

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 2.85" for 2-Yr event
 Inflow = 3.06 cfs @ 12.07 hrs, Volume= 9,837 cf
 Outflow = 0.32 cfs @ 12.73 hrs, Volume= 9,837 cf, Atten= 89%, Lag= 39.8 min
 Primary = 0.32 cfs @ 12.73 hrs, Volume= 9,837 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 29.36' @ 12.73 hrs Surf.Area= 3,328 sf Storage= 3,885 cf

Flood Elev= 31.21' Surf.Area= 3,328 sf Storage= 7,258 cf

Plug-Flow detention time= 139.0 min calculated for 9,835 cf (100% of inflow)

Center-of-Mass det. time= 138.9 min (911.2 - 772.2)

Volume	Invert	Avail.Storage	Storage Description
#1	27.67'	2,926 cf	34.70'W x 95.90'L x 3.50'H Prismatic 11,647 cf Overall - 4,331 cf Embedded = 7,316 cf x 40.0% Voids
#2	28.17'	4,331 cf	ADS_StormTech SC-740 @ 95.90' L x 7 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 95.90'L = 618.8 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		7,258 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	25.15'	24.0" Round 24" SD L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 25.15' / 25.00' S= 0.0100 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	25.15'	2.0" Vert. 2" Orifice C= 0.600
#3	Device 1	29.12'	4.0" Vert. 4" Orifice C= 0.600
#4	Device 1	30.90'	6.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.32 cfs @ 12.73 hrs HW=29.36' (Free Discharge)

↑1=24" SD (Passes 0.32 cfs of 21.39 cfs potential flow)

↑2=2" Orifice (Orifice Controls 0.21 cfs @ 9.78 fps)

↑3=4" Orifice (Orifice Controls 0.11 cfs @ 1.66 fps)

↑4=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Summary for Pond P4.1: STORMTECH DETENTION / OCS-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 2.96" for 2-Yr event
 Inflow = 2.76 cfs @ 12.07 hrs, Volume= 9,043 cf
 Outflow = 0.89 cfs @ 12.35 hrs, Volume= 9,043 cf, Atten= 68%, Lag= 16.6 min
 Primary = 0.89 cfs @ 12.35 hrs, Volume= 9,043 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

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Type III 24-hr 2-Yr Rainfall=3.30"

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Peak Elev= 33.01' @ 12.35 hrs Surf.Area= 1,702 sf Storage= 1,451 cf
 Flood Elev= 34.78' Surf.Area= 1,702 sf Storage= 3,388 cf

Plug-Flow detention time= 8.0 min calculated for 9,043 cf (100% of inflow)
 Center-of-Mass det. time= 7.9 min (772.3 - 764.3)

Volume	Invert	Avail.Storage	Storage Description
#1	31.72'	1,513 cf	25.25'W x 67.40'L x 3.50'H Prismatic 5,956 cf Overall - 2,174 cf Embedded = 3,782 cf x 40.0% Voids
#2	32.22'	2,174 cf	ADS_StormTech SC-740 @ 67.40' L x 5' Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 67.40'L = 434.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		3,687 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	28.76'	24.0" Round 24" SD L= 268.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 28.76' / 22.00' S= 0.0252 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	28.76'	4.0" Vert. 4" Orifice C= 0.600
#3	Device 1	32.90'	6.0" Vert. 6" Orifice C= 0.600
#4	Device 1	33.65'	4.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.89 cfs @ 12.35 hrs HW=33.01' (Free Discharge)

- 1=24" SD (Passes 0.89 cfs of 21.54 cfs potential flow)
- 2=4" Orifice (Orifice Controls 0.85 cfs @ 9.73 fps)
- 3=6" Orifice (Orifice Controls 0.04 cfs @ 1.14 fps)
- 4=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Summary for Pond W: WETLAND

Inflow Area = 917,965 sf, 33.62% Impervious, Inflow Depth = 1.18" for 2-Yr event
 Inflow = 13.72 cfs @ 12.55 hrs, Volume= 90,166 cf
 Outflow = 13.67 cfs @ 12.59 hrs, Volume= 90,166 cf, Atten= 0%, Lag= 2.4 min
 Primary = 13.67 cfs @ 12.59 hrs, Volume= 90,166 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 24.29' @ 12.59 hrs Surf.Area= 6,397 sf Storage= 1,005 cf

Plug-Flow detention time= 0.6 min calculated for 90,147 cf (100% of inflow)
 Center-of-Mass det. time= 0.6 min (885.7 - 885.1)

Volume	Invert	Avail.Storage	Storage Description
#1	23.90'	42,267 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.90	0	0	0
24.00	412	21	21
26.00	41,834	42,246	42,267

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Type III 24-hr 2-Yr Rainfall=3.30"

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Device	Routing	Invert	Outlet Devices
#1	Primary	23.90'	152.0 deg x 17.0' long Sharp-Crested Vee/Trap Weir Cv= 2.47 (C= 3.09)

Primary OutFlow Max=13.67 cfs @ 12.59 hrs HW=24.29' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 13.67 cfs @ 1.89 fps)

Summary for Link AP1: AP 1

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 1.39" for 2-Yr event
Inflow = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf
Primary = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP2: AP 2

Inflow Area = 4,699,294 sf, 15.21% Impervious, Inflow Depth = 1.25" for 2-Yr event
Inflow = 41.09 cfs @ 12.82 hrs, Volume= 488,616 cf
Primary = 41.09 cfs @ 12.82 hrs, Volume= 488,616 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Type III 24-hr 10-Yr Rainfall=4.90"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment OS1: OFFSITE SUB 1 Runoff Area=1,467,784 sf 3.67% Impervious Runoff Depth=1.96"
Flow Length=1,645' Tc=29.1 min CN=70 Runoff=43.39 cfs 240,042 cf

Subcatchment OS2: OFFSITE SUB 2 Runoff Area=913,125 sf 2.70% Impervious Runoff Depth=2.54"
Flow Length=1,654' Tc=58.8 min CN=77 Runoff=24.74 cfs 193,244 cf

Subcatchment S3: SUB 3 Runoff Area=836,116 sf 36.42% Impervious Runoff Depth=2.37"
Flow Length=828' Tc=39.2 min CN=75 Runoff=26.34 cfs 165,023 cf

Subcatchment S3.1: SUB 3.1 Runoff Area=41,451 sf 89.14% Impervious Runoff Depth=4.43"
Flow Length=160' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=4.65 cfs 15,313 cf

Subcatchment S3.2: SUB 3.2 Runoff Area=8,722 sf 9.15% Impervious Runoff Depth=2.90"
Flow Length=163' Slope=0.0220 '/' Tc=5.0 min CN=81 Runoff=0.70 cfs 2,106 cf

Subcatchment S3.3: SUB 3.3 Runoff Area=1,672 sf 27.51% Impervious Runoff Depth=2.63"
Tc=5.0 min CN=78 Runoff=0.12 cfs 366 cf

Subcatchment S4: SUB 4 Runoff Area=1,012,128 sf 16.94% Impervious Runoff Depth=2.81"
Flow Length=1,599' Tc=46.2 min CN=80 Runoff=34.87 cfs 236,652 cf

Subcatchment S4.1: SUB 4.1 Runoff Area=36,714 sf 95.49% Impervious Runoff Depth=4.55"
Flow Length=281' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=4.15 cfs 13,913 cf

Subcatchment S6: SUB 6 Runoff Area=132,680 sf 8.16% Impervious Runoff Depth=2.90"
Flow Length=616' Tc=13.5 min CN=81 Runoff=8.15 cfs 32,033 cf

Subcatchment S7: SUB 3 Runoff Area=167,053 sf 43.24% Impervious Runoff Depth=3.68"
Flow Length=1,081' Tc=10.0 min CN=89 Runoff=14.08 cfs 51,178 cf

Subcatchment S8: SUB 8 Runoff Area=81,849 sf 5.04% Impervious Runoff Depth=2.63"
Flow Length=399' Tc=21.1 min CN=78 Runoff=3.81 cfs 17,918 cf

Reach R1: REACH 1 Avg. Flow Depth=0.24' Max Vel=1.50 fps Inflow=12.07 cfs 240,033 cf
n=0.030 L=386.0' S=0.0104 '/' Capacity=256.49 cfs Outflow=12.06 cfs 240,032 cf

Reach R2: REACH 2 Avg. Flow Depth=0.28' Max Vel=1.61 fps Inflow=15.77 cfs 193,238 cf
n=0.030 L=527.0' S=0.0100 '/' Capacity=252.44 cfs Outflow=15.75 cfs 193,237 cf

Reach R3: REACH 3 Avg. Flow Depth=0.83' Max Vel=4.39 fps Inflow=27.77 cfs 433,269 cf
n=0.030 L=874.0' S=0.0138 '/' Capacity=141.56 cfs Outflow=27.76 cfs 433,266 cf

Reach R3.1: REACH 3.1 Avg. Flow Depth=0.04' Max Vel=0.54 fps Inflow=1.27 cfs 17,785 cf
n=0.025 L=179.0' S=0.0056 '/' Capacity=833.80 cfs Outflow=1.12 cfs 17,785 cf

Reach R3.2: REACH 3.2 Avg. Flow Depth=0.02' Max Vel=0.72 fps Inflow=0.83 cfs 2,472 cf
n=0.025 L=91.3' S=0.0219 '/' Capacity=1,651.08 cfs Outflow=0.79 cfs 2,472 cf

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Type III 24-hr 10-Yr Rainfall=4.90"

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Reach R4: REACH 4	Avg. Flow Depth=0.83' Max Vel=4.89 fps Inflow=31.17 cfs 251,905 cf n=0.030 L=144.0' S=0.0171 '/' Capacity=157.25 cfs Outflow=31.17 cfs 251,905 cf
Reach R4.1: REACH 4.1	Avg. Flow Depth=0.10' Max Vel=1.27 fps Inflow=1.86 cfs 13,912 cf n=0.030 L=552.0' S=0.0145 '/' Capacity=390.71 cfs Outflow=1.69 cfs 13,912 cf
Reach R5: REACH 5	Avg. Flow Depth=1.50' Max Vel=7.01 fps Inflow=84.51 cfs 935,735 cf n=0.025 L=317.0' S=0.0134 '/' Capacity=147.04 cfs Outflow=84.48 cfs 935,735 cf
Reach R6: REACH 6	Avg. Flow Depth=0.33' Max Vel=5.02 fps Inflow=29.61 cfs 200,727 cf n=0.025 L=133.0' S=0.0328 '/' Capacity=623.19 cfs Outflow=29.61 cfs 200,727 cf
Pond AP3: 4 - 24"CMP	Peak Elev=14.16' Storage=25,077 cf Inflow=86.13 cfs 967,767 cf Primary=80.73 cfs 967,742 cf Secondary=0.00 cfs 0 cf Outflow=80.73 cfs 967,742 cf
Pond C3: CULV-3	Peak Elev=33.24' Inflow=12.07 cfs 240,033 cf 24.0" Round Culvert n=0.013 L=169.0' S=0.0095 '/' Outflow=12.07 cfs 240,033 cf
Pond C4: CULV-4	Peak Elev=21.37' Inflow=31.17 cfs 251,905 cf 24.0" Round Culvert n=0.011 L=86.0' S=0.0050 '/' Outflow=31.17 cfs 251,905 cf
Pond C7: CULV-7	Peak Elev=22.46' Storage=3,393 cf Inflow=29.61 cfs 200,727 cf Primary=28.55 cfs 200,727 cf Secondary=0.00 cfs 0 cf Outflow=28.55 cfs 200,727 cf
Pond CB5: CB-5	Peak Elev=324.14' Inflow=0.12 cfs 366 cf 1.0" Round Culvert n=0.010 L=70.0' S=0.0050 '/' Outflow=0.12 cfs 366 cf
Pond CB6: CB-6	Peak Elev=28.35' Inflow=0.83 cfs 2,472 cf 12.0" Round Culvert n=0.013 L=184.0' S=0.0050 '/' Outflow=0.83 cfs 2,472 cf
Pond DMH-1: DMH-1	Peak Elev=33.54' Inflow=4.15 cfs 13,913 cf 24.0" Round Culvert n=0.010 L=30.0' S=0.0077 '/' Outflow=4.15 cfs 13,913 cf
Pond DMH-6: DMH-6	Peak Elev=31.05' Inflow=4.65 cfs 15,313 cf 24.0" Round Culvert n=0.010 L=6.0' S=0.2050 '/' Outflow=4.65 cfs 15,313 cf
Pond OC1: OFFSITE CULV-1	Peak Elev=36.29' Storage=84,783 cf Inflow=43.39 cfs 240,042 cf 18.0" Round Culvert n=0.013 L=97.6' S=0.0201 '/' Outflow=12.07 cfs 240,033 cf
Pond OC2: OFFSITE CULV-2	Peak Elev=36.39' Storage=34,167 cf Inflow=24.74 cfs 193,244 cf 18.0" Round Culvert n=0.013 L=93.6' S=0.0170 '/' Outflow=15.77 cfs 193,238 cf
Pond P3.1: STORMTECH DETENTION /	Peak Elev=30.35' Storage=6,107 cf Inflow=4.65 cfs 15,313 cf Outflow=0.67 cfs 15,313 cf
Pond P4.1: STORMTECH DETENTION /	Peak Elev=33.72' Storage=2,359 cf Inflow=4.15 cfs 13,913 cf Outflow=1.86 cfs 13,912 cf
Pond W: WETLAND	Peak Elev=24.52' Storage=3,039 cf Inflow=28.86 cfs 182,942 cf Outflow=28.65 cfs 182,942 cf

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Link AP1: AP 1

Inflow=31.17 cfs 251,905 cf

Primary=31.17 cfs 251,905 cf

Link AP2: AP 2

Inflow=80.73 cfs 967,742 cf

Primary=80.73 cfs 967,742 cf

Total Runoff Area = 4,699,294 sf Runoff Volume = 967,788 cf Average Runoff Depth = 2.47"
84.79% Pervious = 3,984,423 sf 15.21% Impervious = 714,871 sf

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Type III 24-hr 10-Yr Rainfall=4.90"

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Summary for Subcatchment OS1: OFFSITE SUB 1

Runoff = 43.39 cfs @ 12.42 hrs, Volume= 240,042 cf, Depth= 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
53,844	98	Paved parking & roofs
32,748	49	50-75% Grass cover, Fair, HSG A
12,803	79	50-75% Grass cover, Fair, HSG C
12,554	84	50-75% Grass cover, Fair, HSG D
205,440	30	Woods, Good, HSG A
228,765	70	Woods, Good, HSG C
921,630	77	Woods, Good, HSG D
1,467,784	70	Weighted Average
1,413,940		96.33% Pervious Area
53,844		3.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0430	0.25		Sheet Flow, A - B
					Range n= 0.130 P2= 3.00"
0.8	75	0.0510	1.58		Shallow Concentrated Flow, B -C
					Short Grass Pasture Kv= 7.0 fps
20.3	923	0.0230	0.76		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
1.4	547	0.0180	6.31	157.83	Channel Flow, D - E
					Area= 25.0 sf Perim= 27.0' r= 0.93'
					n= 0.030 Earth, grassed & winding
29.1	1,645	Total			

Summary for Subcatchment OS2: OFFSITE SUB 2

Runoff = 24.74 cfs @ 12.81 hrs, Volume= 193,244 cf, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
24,623	98	Paved parking & roofs
8,226	79	50-75% Grass cover, Fair, HSG C
13,667	84	50-75% Grass cover, Fair, HSG D
151,095	70	Woods, Good, HSG C
715,514	77	Woods, Good, HSG D
913,125	77	Weighted Average
888,502		97.30% Pervious Area
24,623		2.70% Impervious Area

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Type III 24-hr 10-Yr Rainfall=4.90"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0530	0.11		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
43.8	1,554	0.0140	0.59		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
58.8	1,654	Total			

Summary for Subcatchment S3: SUB 3

Runoff = 26.34 cfs @ 12.55 hrs, Volume= 165,023 cf, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
304,505	98	Paved parking & roofs
45,477	49	50-75% Grass cover, Fair, HSG A
10,125	79	50-75% Grass cover, Fair, HSG C
78,239	84	50-75% Grass cover, Fair, HSG D
142,893	30	Woods, Good, HSG A
81,209	70	Woods, Good, HSG C
173,668	77	Woods, Good, HSG D
836,116	75	Weighted Average
531,611		63.58% Pervious Area
304,505		36.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.0950	0.15		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.5	143	0.1000	1.58		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
21.3	535	0.0070	0.42		Shallow Concentrated Flow, C -D
					Woodland Kv= 5.0 fps
39.2	828	Total			

Summary for Subcatchment S3.1: SUB 3.1

Runoff = 4.65 cfs @ 12.07 hrs, Volume= 15,313 cf, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

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Type III 24-hr 10-Yr Rainfall=4.90"

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Area (sf)	CN	Description
36,951	98	Paved parking & roofs
3,700	79	50-75% Grass cover, Fair, HSG C
800	84	50-75% Grass cover, Fair, HSG D
41,451	96	Weighted Average
4,500		10.86% Pervious Area
36,951		89.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	160	0.0100	1.11		Sheet Flow, A - B
					Smooth surfaces n= 0.011 P2= 3.00"
2.6					Direct Entry, Min Tc
5.0	160	Total			

Summary for Subcatchment S3.2: SUB 3.2

Runoff = 0.70 cfs @ 12.07 hrs, Volume= 2,106 cf, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
798	98	Paved parking & roofs
7,924	79	50-75% Grass cover, Fair, HSG C
8,722	81	Weighted Average
7,924		90.85% Pervious Area
798		9.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	163	0.0220	1.04		Shallow Concentrated Flow, A - B
					Short Grass Pasture Kv= 7.0 fps
2.4					Direct Entry,
5.0	163	Total			

Summary for Subcatchment S3.3: SUB 3.3

Runoff = 0.12 cfs @ 12.08 hrs, Volume= 366 cf, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
460	98	Paved parking & roofs
1,212	70	Woods, Good, HSG C
1,672	78	Weighted Average
1,212		72.49% Pervious Area
460		27.51% Impervious Area

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Type III 24-hr 10-Yr Rainfall=4.90"

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

Summary for Subcatchment S4: SUB 4

Runoff = 34.87 cfs @ 12.63 hrs, Volume= 236,652 cf, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
171,450	98	Paved parking & roofs
20,781	79	50-75% Grass cover, Fair, HSG C
7,642	84	50-75% Grass cover, Fair, HSG D
419,188	73	Woods, Fair, HSG C
393,067	79	Woods, Fair, HSG D
1,012,128	80	Weighted Average
840,678		83.06% Pervious Area
171,450		16.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.3	100	0.0100	0.06		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.9	284	0.0600	1.22		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
10.4	341	0.0120	0.55		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
2.6	874	0.0140	5.64	281.88	Channel Flow, D - E
					Area= 50.0 sf Perim= 53.0' r= 0.94'
					n= 0.030 Earth, grassed & winding
46.2	1,599	Total			

Summary for Subcatchment S4.1: SUB 4.1

Runoff = 4.15 cfs @ 12.07 hrs, Volume= 13,913 cf, Depth= 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
35,058	98	Paved parking & roofs
1,656	74	>75% Grass cover, Good, HSG C
36,714	97	Weighted Average
1,656		4.51% Pervious Area
35,058		95.49% Impervious Area

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Type III 24-hr 10-Yr Rainfall=4.90"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	200	0.0100	1.16		Sheet Flow, A - B Smooth surfaces n= 0.011 P2= 3.00"
0.7	81	0.0100	2.03		Shallow Concentrated Flow, B - C Paved Kv= 20.3 fps
1.4					Direct Entry, Min Tc
5.0	281	Total			

Summary for Subcatchment S6: SUB 6

Runoff = 8.15 cfs @ 12.19 hrs, Volume= 32,033 cf, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
10,824	98	Paved parking & roofs
19,401	79	50-75% Grass cover, Fair, HSG C
64,092	84	50-75% Grass cover, Fair, HSG D
32,603	70	Woods, Good, HSG C
5,760	77	Woods, Good, HSG D
132,680	81	Weighted Average
121,856		91.84% Pervious Area
10,824		8.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	40	0.0410	0.08		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	71	0.1120	1.67		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
4.5	265	0.0380	0.97		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
0.3	240	0.0250	11.44	686.23	Channel Flow, C - D Area= 60.0 sf Perim= 34.0' r= 1.76' n= 0.030 Earth, grassed & winding
13.5	616	Total			

Summary for Subcatchment S7: SUB 3

Runoff = 14.08 cfs @ 12.14 hrs, Volume= 51,178 cf, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

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Area (sf)	CN	Description
72,236	98	Paved parking & roofs
66,092	84	50-75% Grass cover, Fair, HSG D
5,176	73	Woods, Fair, HSG C
23,549	79	Woods, Fair, HSG D
167,053	89	Weighted Average
94,817		56.76% Pervious Area
72,236		43.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	58	0.0430	0.20		Sheet Flow, A - B Grass: Short n= 0.150 P2= 3.00"
1.1	136	0.0840	2.03		Shallow Concentrated Flow, B - C Short Grass Pasture Kv= 7.0 fps
2.8	424	0.0150	2.49		Shallow Concentrated Flow, C - D Paved Kv= 20.3 fps
0.1	39	0.0450	9.55	3.33	Pipe Channel, D - E 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
0.3	185	0.0380	11.66	116.60	Channel Flow, E - F Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.5	137	0.0168	4.82	0.95	Pipe Channel, F - G 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
0.4	102	0.0042	4.67	14.66	Pipe Channel, G - H 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
10.0	1,081	Total			

Summary for Subcatchment S8: SUB 8

Runoff = 3.81 cfs @ 12.30 hrs, Volume= 17,918 cf, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
4,122	98	Paved parking & roofs
439	79	50-75% Grass cover, Fair, HSG C
34,658	74	>75% Grass cover, Good, HSG C
4,166	73	Woods, Fair, HSG C
38,464	79	Woods, Fair, HSG D
81,849	78	Weighted Average
77,727		94.96% Pervious Area
4,122		5.04% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	120	0.0500	0.11		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
1.4	138	0.1100	1.66		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
1.9	141	0.0320	1.25		Shallow Concentrated Flow, C - D Short Grass Pasture Kv= 7.0 fps
21.1	399	Total			

Summary for Reach R1: REACH 1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 1.96" for 10-Yr event
 Inflow = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf
 Outflow = 12.06 cfs @ 13.29 hrs, Volume= 240,032 cf, Atten= 0%, Lag= 7.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.50 fps, Min. Travel Time= 4.3 min
 Avg. Velocity = 0.53 fps, Avg. Travel Time= 12.2 min

Peak Storage= 3,099 cf @ 13.22 hrs
 Average Depth at Peak Storage= 0.24'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 256.49 cfs

100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
 Length= 386.0' Slope= 0.0104 '/'
 Inlet Invert= 30.00', Outlet Invert= 26.00'

**Summary for Reach R2: REACH 2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 2.54" for 10-Yr event
 Inflow = 15.77 cfs @ 13.31 hrs, Volume= 193,238 cf
 Outflow = 15.75 cfs @ 13.46 hrs, Volume= 193,237 cf, Atten= 0%, Lag= 9.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.61 fps, Min. Travel Time= 5.4 min
 Avg. Velocity = 0.47 fps, Avg. Travel Time= 18.7 min

Peak Storage= 5,145 cf @ 13.37 hrs
 Average Depth at Peak Storage= 0.28'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 252.44 cfs

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100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 527.0' Slope= 0.0100 '/'
Inlet Invert= 31.29', Outlet Invert= 26.00'



Summary for Reach R3: REACH 3

Inflow Area = 2,380,909 sf, 3.30% Impervious, Inflow Depth = 2.18" for 10-Yr event
Inflow = 27.77 cfs @ 13.43 hrs, Volume= 433,269 cf
Outflow = 27.76 cfs @ 13.52 hrs, Volume= 433,266 cf, Atten= 0%, Lag= 5.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.39 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.29 fps, Avg. Travel Time= 11.3 min

Peak Storage= 5,533 cf @ 13.47 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 141.56 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 874.0' Slope= 0.0138 '/'
Inlet Invert= 26.00', Outlet Invert= 13.90'



Summary for Reach R3.1: REACH 3.1

Inflow Area = 51,845 sf, 73.70% Impervious, Inflow Depth = 4.12" for 10-Yr event
Inflow = 1.27 cfs @ 12.14 hrs, Volume= 17,785 cf
Outflow = 1.12 cfs @ 12.32 hrs, Volume= 17,785 cf, Atten= 12%, Lag= 10.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.54 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 0.34 fps, Avg. Travel Time= 8.7 min

Peak Storage= 375 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 833.80 cfs

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50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 179.0' Slope= 0.0056 '/'
Inlet Invert= 24.90', Outlet Invert= 23.90'



Summary for Reach R3.2: REACH 3.2

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 2.85" for 10-Yr event
Inflow = 0.83 cfs @ 12.07 hrs, Volume= 2,472 cf
Outflow = 0.79 cfs @ 12.13 hrs, Volume= 2,472 cf, Atten= 4%, Lag= 3.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.72 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 2.4 min

Peak Storage= 101 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 1,651.08 cfs

50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 91.3' Slope= 0.0219 '/'
Inlet Invert= 26.90', Outlet Invert= 24.90'



Summary for Reach R4: REACH 4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 2.66" for 10-Yr event
Inflow = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf
Outflow = 31.17 cfs @ 12.58 hrs, Volume= 251,905 cf, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.89 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 1.5 min

Peak Storage= 918 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 157.25 cfs

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6.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 14.00'

Length= 144.0' Slope= 0.0171 ' '

Inlet Invert= 16.36', Outlet Invert= 13.90'



Summary for Reach R4.1: REACH 4.1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 4.55" for 10-Yr event

Inflow = 1.86 cfs @ 12.22 hrs, Volume= 13,912 cf

Outflow = 1.69 cfs @ 12.43 hrs, Volume= 13,912 cf, Atten= 10%, Lag= 12.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 1.27 fps, Min. Travel Time= 7.3 min

Avg. Velocity = 0.51 fps, Avg. Travel Time= 18.0 min

Peak Storage= 735 cf @ 12.31 hrs

Average Depth at Peak Storage= 0.10'

Bank-Full Depth= 2.00' Flow Area= 56.0 sf, Capacity= 390.71 cfs

12.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 8.0 ' ' Top Width= 44.00'

Length= 552.0' Slope= 0.0145 ' '

Inlet Invert= 22.00', Outlet Invert= 14.00'



Summary for Reach R5: REACH 5

Inflow Area = 4,566,614 sf, 15.42% Impervious, Inflow Depth = 2.46" for 10-Yr event

Inflow = 84.51 cfs @ 12.73 hrs, Volume= 935,735 cf

Outflow = 84.48 cfs @ 12.75 hrs, Volume= 935,735 cf, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 7.01 fps, Min. Travel Time= 0.8 min

Avg. Velocity = 1.71 fps, Avg. Travel Time= 3.1 min

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Peak Storage= 3,818 cf @ 12.74 hrs

Average Depth at Peak Storage= 1.50'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 147.04 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 13.00'

Length= 317.0' Slope= 0.0134 ' '

Inlet Invert= 13.90', Outlet Invert= 9.64'



Summary for Reach R6: REACH 6

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 2.48" for 10-Yr event

Inflow = 29.61 cfs @ 12.57 hrs, Volume= 200,727 cf

Outflow = 29.61 cfs @ 12.58 hrs, Volume= 200,727 cf, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 5.02 fps, Min. Travel Time= 0.4 min

Avg. Velocity = 1.50 fps, Avg. Travel Time= 1.5 min

Peak Storage= 784 cf @ 12.58 hrs

Average Depth at Peak Storage= 0.33'

Bank-Full Depth= 2.00' Flow Area= 42.0 sf, Capacity= 623.19 cfs

17.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 2.0 ' ' Top Width= 25.00'

Length= 133.0' Slope= 0.0328 ' '

Inlet Invert= 23.90', Outlet Invert= 19.54'



Summary for Pond AP3: 4 - 24" CMP

Inflow Area = 4,699,294 sf, 15.21% Impervious, Inflow Depth = 2.47" for 10-Yr event

Inflow = 86.13 cfs @ 12.74 hrs, Volume= 967,767 cf

Outflow = 80.73 cfs @ 12.91 hrs, Volume= 967,742 cf, Atten= 6%, Lag= 10.0 min

Primary = 80.73 cfs @ 12.91 hrs, Volume= 967,742 cf

Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 6

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Peak Elev= 14.16' @ 12.91 hrs Surf.Area= 15,678 sf Storage= 25,077 cf

Plug-Flow detention time= 2.6 min calculated for 967,742 cf (100% of inflow)

Center-of-Mass det. time= 2.6 min (905.3 - 902.8)

Volume	Invert	Avail.Storage	Storage Description
#1	9.64'	96,037 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.64	0	0	0
10.00	856	154	154
12.00	4,037	4,893	5,047
14.00	13,588	17,625	22,672
16.00	39,016	52,604	75,276
16.50	44,026	20,761	96,037

Device	Routing	Invert	Outlet Devices
#1	Primary	9.77'	24.0" Round Proposed 3 - 24" CMP X 3.00 L= 65.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.12' S= 0.0100 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Primary	9.83'	24.0" Round Existing 24" CMP L= 64.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.83' S= -0.0009 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#3	Secondary	16.50'	20.0' long x 25.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=80.73 cfs @ 12.91 hrs HW=14.16' (Free Discharge)↑ **1=Proposed 3 - 24" CMP** (Barrel Controls 62.24 cfs @ 6.60 fps)↑ **2=Existing 24" CMP** (Barrel Controls 18.49 cfs @ 5.89 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=9.64' (Free Discharge)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond C3: CULV-3**

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 1.96" for 10-Yr event
 Inflow = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf
 Outflow = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf, Atten= 0%, Lag= 0.0 min
 Primary = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.24' @ 13.17 hrs

Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.60'	24.0" Round Culvert L= 169.0' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 31.60' / 30.00' S= 0.0095 '/' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 3.14 sf

Primary OutFlow Max=12.07 cfs @ 13.17 hrs HW=33.24' TW=31.60' (Fixed TW Elev= 31.60')

↑**1=Culvert** (Outlet Controls 12.07 cfs @ 5.94 fps)

Summary for Pond C4: CULV-4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 2.66" for 10-Yr event
 Inflow = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf
 Outflow = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf, Atten= 0%, Lag= 0.0 min
 Primary = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 21.37' @ 12.57 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.79'	24.0" Round Culvert L= 86.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 16.79' / 16.36' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=31.17 cfs @ 12.57 hrs HW=21.37' (Free Discharge)

↑**1=Culvert** (Barrel Controls 31.17 cfs @ 9.92 fps)

Summary for Pond C7: CULV-7

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 2.48" for 10-Yr event
 Inflow = 29.61 cfs @ 12.58 hrs, Volume= 200,727 cf
 Outflow = 28.55 cfs @ 12.68 hrs, Volume= 200,727 cf, Atten= 4%, Lag= 5.8 min
 Primary = 28.55 cfs @ 12.68 hrs, Volume= 200,727 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 22.46' @ 12.68 hrs Surf.Area= 4,096 sf Storage= 3,393 cf

Plug-Flow detention time= 0.8 min calculated for 200,685 cf (100% of inflow)
 Center-of-Mass det. time= 0.8 min (870.5 - 869.7)

Volume	Invert	Avail.Storage	Storage Description
#1	19.54'	9,728 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.54	0	0	0
20.00	144	33	33
21.00	890	517	550
22.00	2,015	1,453	2,003
23.00	6,588	4,302	6,304
23.50	7,106	3,424	9,728

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Device	Routing	Invert	Outlet Devices
#1	Primary	19.54'	24.0" Round 24" RCP L= 184.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 19.54' / 16.79' S= 0.0149 '/ Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	23.40'	250.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=28.54 cfs @ 12.68 hrs HW=22.46' (Free Discharge)

↑1=24" RCP (Inlet Controls 28.54 cfs @ 9.09 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.54' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond CB5: CB-5

Inflow Area = 1,672 sf, 27.51% Impervious, Inflow Depth = 2.63" for 10-Yr event
 Inflow = 0.12 cfs @ 12.08 hrs, Volume= 366 cf
 Outflow = 0.12 cfs @ 12.08 hrs, Volume= 366 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.12 cfs @ 12.08 hrs, Volume= 366 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 324.14' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	29.50'	1.0" Round 12" CULV L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.50' / 29.15' S= 0.0050 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.01 sf

Primary OutFlow Max=0.12 cfs @ 12.08 hrs HW=322.93' (Free Discharge)

↑1=12" CULV (Barrel Controls 0.12 cfs @ 22.43 fps)

Summary for Pond CB6: CB-6

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 2.85" for 10-Yr event
 Inflow = 0.83 cfs @ 12.07 hrs, Volume= 2,472 cf
 Outflow = 0.83 cfs @ 12.07 hrs, Volume= 2,472 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.83 cfs @ 12.07 hrs, Volume= 2,472 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 28.35' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.82'	12.0" Round 12"SD L= 184.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 27.82' / 26.90' S= 0.0050 '/ Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 0.79 sf

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Primary OutFlow Max=0.83 cfs @ 12.07 hrs HW=28.35' (Free Discharge)

↑1=12"SD (Barrel Controls 0.83 cfs @ 2.85 fps)

Summary for Pond DMH-1: DMH-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 4.55" for 10-Yr event
 Inflow = 4.15 cfs @ 12.07 hrs, Volume= 13,913 cf
 Outflow = 4.15 cfs @ 12.07 hrs, Volume= 13,913 cf, Atten= 0%, Lag= 0.0 min
 Primary = 4.15 cfs @ 12.07 hrs, Volume= 13,913 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.54' @ 12.07 hrs

Flood Elev= 36.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.58'	24.0" Round 24" SD to Detention Bed L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 32.58' / 32.35' S= 0.0077 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.15 cfs @ 12.07 hrs HW=33.54' (Free Discharge)

↑1=24" SD to Detention Bed (Barrel Controls 4.15 cfs @ 4.09 fps)

Summary for Pond DMH-6: DMH-6

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 4.43" for 10-Yr event
 Inflow = 4.65 cfs @ 12.07 hrs, Volume= 15,313 cf
 Outflow = 4.65 cfs @ 12.07 hrs, Volume= 15,313 cf, Atten= 0%, Lag= 0.0 min
 Primary = 4.65 cfs @ 12.07 hrs, Volume= 15,313 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 31.05' @ 12.07 hrs

Flood Elev= 32.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	30.13'	24.0" Round 24" SD to Detention Bed L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 30.13' / 28.90' S= 0.2050 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.64 cfs @ 12.07 hrs HW=31.05' (Free Discharge)

↑1=24" SD to Detention Bed (Inlet Controls 4.64 cfs @ 3.27 fps)

Summary for Pond OC1: OFFSITE CULV-1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 1.96" for 10-Yr event
 Inflow = 43.39 cfs @ 12.42 hrs, Volume= 240,042 cf
 Outflow = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf, Atten= 72%, Lag= 44.6 min
 Primary = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf

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Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 36.29' @ 13.17 hrs Surf.Area= 77,683 sf Storage= 84,783 cf

Plug-Flow detention time= 91.3 min calculated for 239,983 cf (100% of inflow)

Center-of-Mass det. time= 91.4 min (961.6 - 870.2)

Volume	Invert	Avail.Storage	Storage Description
#1	34.25'	602,689 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.25	5,289	0	0
36.00	67,698	63,864	63,864
38.00	137,090	204,788	268,652
40.00	196,947	334,037	602,689

Device	Routing	Invert	Outlet Devices
#1	Primary	34.25'	18.0" Round 18" RCP L= 97.6' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 34.25' / 32.29' S= 0.0201 ' S= 0.0201 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=12.07 cfs @ 13.17 hrs HW=36.29' (Free Discharge)↑**1=18" RCP** (Inlet Controls 12.07 cfs @ 6.83 fps)**Summary for Pond OC2: OFFSITE CULV-2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 2.54" for 10-Yr event
 Inflow = 24.74 cfs @ 12.81 hrs, Volume= 193,244 cf
 Outflow = 15.77 cfs @ 13.31 hrs, Volume= 193,238 cf, Atten= 36%, Lag= 30.0 min
 Primary = 15.77 cfs @ 13.31 hrs, Volume= 193,238 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 36.39' @ 13.31 hrs Surf.Area= 15,927 sf Storage= 34,167 cf

Plug-Flow detention time= 30.2 min calculated for 193,238 cf (100% of inflow)

Center-of-Mass det. time= 30.1 min (909.7 - 879.6)

Volume	Invert	Avail.Storage	Storage Description
#1	32.88'	71,548 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.88	5,285	0	0
34.00	8,520	7,731	7,731
36.00	12,392	20,912	28,643
38.00	30,513	42,905	71,548

Device	Routing	Invert	Outlet Devices
#1	Primary	32.88'	18.0" Round 18" RCP L= 93.6' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 32.88' / 31.29' S= 0.0170 ' / ' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=15.77 cfs @ 13.31 hrs HW=36.39' (Free Discharge)

Summary for Pond P3.1: STORMTECH DETENTION / OCS-2

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 4.43" for 10-Yr event
 Inflow = 4.65 cfs @ 12.07 hrs, Volume= 15,313 cf
 Outflow = 0.67 cfs @ 12.55 hrs, Volume= 15,313 cf, Atten= 86%, Lag= 28.9 min
 Primary = 0.67 cfs @ 12.55 hrs, Volume= 15,313 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 30.35' @ 12.55 hrs Surf.Area= 3,328 sf Storage= 6,107 cf
 Flood Elev= 31.21' Surf.Area= 3,328 sf Storage= 7,258 cf

Plug-Flow detention time= 135.9 min calculated for 15,313 cf (100% of inflow)
 Center-of-Mass det. time= 135.9 min (897.9 - 761.9)

Volume	Invert	Avail.Storage	Storage Description
#1	27.67'	2,926 cf	34.70'W x 95.90'L x 3.50'H Prismatic 11,647 cf Overall - 4,331 cf Embedded = 7,316 cf x 40.0% Voids
#2	28.17'	4,331 cf	ADS_StormTech SC-740 @ 95.90' L x 7 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 95.90'L = 618.8 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
			7,258 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	25.15'	24.0" Round 24" SD L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 25.15' / 25.00' S= 0.0100 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	25.15'	2.0" Vert. 2" Orifice C= 0.600
#3	Device 1	29.12'	4.0" Vert. 4" Orifice C= 0.600
#4	Device 1	30.90'	6.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.67 cfs @ 12.55 hrs HW=30.35' (Free Discharge)

Summary for Pond P4.1: STORMTECH DETENTION / OCS-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 4.55" for 10-Yr event
 Inflow = 4.15 cfs @ 12.07 hrs, Volume= 13,913 cf
 Outflow = 1.86 cfs @ 12.22 hrs, Volume= 13,912 cf, Atten= 55%, Lag= 9.2 min
 Primary = 1.86 cfs @ 12.22 hrs, Volume= 13,912 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

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Peak Elev= 33.72' @ 12.22 hrs Surf.Area= 1,702 sf Storage= 2,359 cf
 Flood Elev= 34.78' Surf.Area= 1,702 sf Storage= 3,388 cf

Plug-Flow detention time= 9.8 min calculated for 13,910 cf (100% of inflow)
 Center-of-Mass det. time= 9.8 min (765.1 - 755.3)

Volume	Invert	Avail.Storage	Storage Description
#1	31.72'	1,513 cf	25.25'W x 67.40'L x 3.50'H Prismatic 5,956 cf Overall - 2,174 cf Embedded = 3,782 cf x 40.0% Voids
#2	32.22'	2,174 cf	ADS_StormTech SC-740 @ 67.40' L x 5 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 67.40'L = 434.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		3,687 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	28.76'	24.0" Round 24" SD L= 268.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 28.76' / 22.00' S= 0.0252 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	28.76'	4.0" Vert. 4" Orifice C= 0.600
#3	Device 1	32.90'	6.0" Vert. 6" Orifice C= 0.600
#4	Device 1	33.65'	4.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=1.86 cfs @ 12.22 hrs HW=33.72' (Free Discharge)

- 1=24" SD (Passes 1.86 cfs of 23.76 cfs potential flow)
- 2=4" Orifice (Orifice Controls 0.92 cfs @ 10.54 fps)
- 3=6" Orifice (Orifice Controls 0.71 cfs @ 3.63 fps)
- 4=Sharp-Crested Vee/Trap Weir (Weir Controls 0.23 cfs @ 0.85 fps)

Summary for Pond W: WETLAND

Inflow Area = 917,965 sf, 33.62% Impervious, Inflow Depth = 2.39" for 10-Yr event
 Inflow = 28.86 cfs @ 12.54 hrs, Volume= 182,942 cf
 Outflow = 28.65 cfs @ 12.57 hrs, Volume= 182,942 cf, Atten= 1%, Lag= 2.0 min
 Primary = 28.65 cfs @ 12.57 hrs, Volume= 182,942 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 24.52' @ 12.57 hrs Surf.Area= 11,189 sf Storage= 3,039 cf

Plug-Flow detention time= 0.9 min calculated for 182,904 cf (100% of inflow)
 Center-of-Mass det. time= 0.9 min (865.2 - 864.2)

Volume	Invert	Avail.Storage	Storage Description
#1	23.90'	42,267 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.90	0	0	0
24.00	412	21	21
26.00	41,834	42,246	42,267

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Type III 24-hr 10-Yr Rainfall=4.90"

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Device	Routing	Invert	Outlet Devices
#1	Primary	23.90'	152.0 deg x 17.0' long Sharp-Crested Vee/Trap Weir Cv= 2.47 (C= 3.09)

Primary OutFlow Max=28.65 cfs @ 12.57 hrs HW=24.52' (Free Discharge)

↑**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 28.65 cfs @ 2.37 fps)

Summary for Link AP1: AP 1

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 2.66" for 10-Yr event
Inflow = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf
Primary = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP2: AP 2

Inflow Area = 4,699,294 sf, 15.21% Impervious, Inflow Depth = 2.47" for 10-Yr event
Inflow = 80.73 cfs @ 12.91 hrs, Volume= 967,742 cf
Primary = 80.73 cfs @ 12.91 hrs, Volume= 967,742 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment OS1: OFFSITE SUB 1 Runoff Area=1,467,784 sf 3.67% Impervious Runoff Depth=2.96"
Flow Length=1,645' Tc=29.1 min CN=70 Runoff=66.68 cfs 362,632 cf

Subcatchment OS2: OFFSITE SUB 2 Runoff Area=913,125 sf 2.70% Impervious Runoff Depth=3.65"
Flow Length=1,654' Tc=58.8 min CN=77 Runoff=35.70 cfs 278,070 cf

Subcatchment S3: SUB 3 Runoff Area=836,116 sf 36.42% Impervious Runoff Depth=3.45"
Flow Length=828' Tc=39.2 min CN=75 Runoff=38.62 cfs 240,602 cf

Subcatchment S3.1: SUB 3.1 Runoff Area=41,451 sf 89.14% Impervious Runoff Depth=5.73"
Flow Length=160' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=5.92 cfs 19,781 cf

Subcatchment S3.2: SUB 3.2 Runoff Area=8,722 sf 9.15% Impervious Runoff Depth=4.07"
Flow Length=163' Slope=0.0220 '/' Tc=5.0 min CN=81 Runoff=0.98 cfs 2,956 cf

Subcatchment S3.3: SUB 3.3 Runoff Area=1,672 sf 27.51% Impervious Runoff Depth=3.76"
Tc=5.0 min CN=78 Runoff=0.17 cfs 523 cf

Subcatchment S4: SUB 4 Runoff Area=1,012,128 sf 16.94% Impervious Runoff Depth=3.96"
Flow Length=1,599' Tc=46.2 min CN=80 Runoff=49.13 cfs 334,187 cf

Subcatchment S4.1: SUB 4.1 Runoff Area=36,714 sf 95.49% Impervious Runoff Depth=5.84"
Flow Length=281' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=5.28 cfs 17,879 cf

Subcatchment S6: SUB 6 Runoff Area=132,680 sf 8.16% Impervious Runoff Depth=4.07"
Flow Length=616' Tc=13.5 min CN=81 Runoff=11.37 cfs 44,961 cf

Subcatchment S7: SUB 3 Runoff Area=167,053 sf 43.24% Impervious Runoff Depth=4.93"
Flow Length=1,081' Tc=10.0 min CN=89 Runoff=18.60 cfs 68,622 cf

Subcatchment S8: SUB 8 Runoff Area=81,849 sf 5.04% Impervious Runoff Depth=3.76"
Flow Length=399' Tc=21.1 min CN=78 Runoff=5.45 cfs 25,620 cf

Reach R1: REACH 1 Avg. Flow Depth=0.27' Max Vel=1.59 fps Inflow=14.59 cfs 362,623 cf
n=0.030 L=386.0' S=0.0104 '/' Capacity=256.49 cfs Outflow=14.59 cfs 362,621 cf

Reach R2: REACH 2 Avg. Flow Depth=0.30' Max Vel=1.69 fps Inflow=18.37 cfs 278,064 cf
n=0.030 L=527.0' S=0.0100 '/' Capacity=252.44 cfs Outflow=18.35 cfs 278,063 cf

Reach R3: REACH 3 Avg. Flow Depth=0.91' Max Vel=4.63 fps Inflow=32.93 cfs 640,684 cf
n=0.030 L=874.0' S=0.0138 '/' Capacity=141.56 cfs Outflow=32.92 cfs 640,681 cf

Reach R3.1: REACH 3.1 Avg. Flow Depth=0.07' Max Vel=0.76 fps Inflow=2.89 cfs 23,260 cf
n=0.025 L=179.0' S=0.0056 '/' Capacity=833.80 cfs Outflow=2.70 cfs 23,260 cf

Reach R3.2: REACH 3.2 Avg. Flow Depth=0.03' Max Vel=0.84 fps Inflow=1.16 cfs 3,479 cf
n=0.025 L=91.3' S=0.0219 '/' Capacity=1,651.08 cfs Outflow=1.13 cfs 3,479 cf

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Reach R4: REACH 4	Avg. Flow Depth=1.06' Max Vel=5.59 fps Inflow=48.21 cfs 358,096 cf n=0.030 L=144.0' S=0.0171 '/' Capacity=157.25 cfs Outflow=48.14 cfs 358,096 cf
Reach R4.1: REACH 4.1	Avg. Flow Depth=0.15' Max Vel=1.57 fps Inflow=3.99 cfs 17,880 cf n=0.030 L=552.0' S=0.0145 '/' Capacity=390.71 cfs Outflow=3.05 cfs 17,880 cf
Reach R5: REACH 5	Avg. Flow Depth=1.80' Max Vel=7.72 fps Inflow=119.32 cfs 1,350,844 cf n=0.025 L=317.0' S=0.0134 '/' Capacity=147.04 cfs Outflow=119.28 cfs 1,350,843 cf
Reach R6: REACH 6	Avg. Flow Depth=0.42' Max Vel=5.82 fps Inflow=43.76 cfs 289,481 cf n=0.025 L=133.0' S=0.0328 '/' Capacity=623.19 cfs Outflow=43.76 cfs 289,481 cf
Pond AP3: 4 - 24"CMP	Peak Elev=15.68' Storage=63,392 cf Inflow=122.30 cfs 1,395,804 cf Primary=99.79 cfs 1,395,789 cf Secondary=0.00 cfs 0 cf Outflow=99.79 cfs 1,395,789 cf
Pond C3: CULV-3	Peak Elev=33.42' Inflow=14.59 cfs 362,623 cf 24.0" Round Culvert n=0.013 L=169.0' S=0.0095 '/' Outflow=14.59 cfs 362,623 cf
Pond C4: CULV-4	Peak Elev=25.56' Inflow=48.21 cfs 358,096 cf 24.0" Round Culvert n=0.011 L=86.0' S=0.0050 '/' Outflow=48.21 cfs 358,096 cf
Pond C7: CULV-7	Peak Elev=23.47' Storage=9,483 cf Inflow=43.76 cfs 289,481 cf Primary=32.92 cfs 280,765 cf Secondary=10.80 cfs 8,708 cf Outflow=43.72 cfs 289,474 cf
Pond CB5: CB-5	Peak Elev=629.89' Inflow=0.17 cfs 523 cf 1.0" Round Culvert n=0.010 L=70.0' S=0.0050 '/' Outflow=0.17 cfs 523 cf
Pond CB6: CB-6	Peak Elev=28.46' Inflow=1.16 cfs 3,479 cf 12.0" Round Culvert n=0.013 L=184.0' S=0.0050 '/' Outflow=1.16 cfs 3,479 cf
Pond DMH-1: DMH-1	Peak Elev=33.68' Inflow=5.28 cfs 17,879 cf 24.0" Round Culvert n=0.010 L=30.0' S=0.0077 '/' Outflow=5.28 cfs 17,879 cf
Pond DMH-6: DMH-6	Peak Elev=31.19' Inflow=5.92 cfs 19,781 cf 24.0" Round Culvert n=0.010 L=6.0' S=0.2050 '/' Outflow=5.92 cfs 19,781 cf
Pond OC1: OFFSITE CULV-1	Peak Elev=36.95' Storage=143,927 cf Inflow=66.68 cfs 362,632 cf 18.0" Round Culvert n=0.013 L=97.6' S=0.0201 '/' Outflow=14.59 cfs 362,623 cf
Pond OC2: OFFSITE CULV-2	Peak Elev=37.67' Storage=62,087 cf Inflow=35.70 cfs 278,070 cf 18.0" Round Culvert n=0.013 L=93.6' S=0.0170 '/' Outflow=18.37 cfs 278,064 cf
Pond P3.1: STORMTECH DETENTION /	Peak Elev=31.08' Storage=7,136 cf Inflow=5.92 cfs 19,781 cf Outflow=2.30 cfs 19,781 cf
Pond P4.1: STORMTECH DETENTION /	Peak Elev=33.95' Storage=2,637 cf Inflow=5.28 cfs 17,879 cf Outflow=3.99 cfs 17,880 cf
Pond W: WETLAND	Peak Elev=24.68' Storage=5,150 cf Inflow=42.30 cfs 266,221 cf Outflow=41.85 cfs 266,221 cf

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Link AP1: AP 1

Inflow=48.21 cfs 358,096 cf

Primary=48.21 cfs 358,096 cf

Link AP2: AP 2

Inflow=99.79 cfs 1,395,789 cf

Primary=99.79 cfs 1,395,789 cf

Total Runoff Area = 4,699,294 sf Runoff Volume = 1,395,833 cf Average Runoff Depth = 3.56"
84.79% Pervious = 3,984,423 sf 15.21% Impervious = 714,871 sf

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Type III 24-hr 25-Yr Rainfall=6.20"

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Summary for Subcatchment OS1: OFFSITE SUB 1

Runoff = 66.68 cfs @ 12.41 hrs, Volume= 362,632 cf, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
53,844	98	Paved parking & roofs
32,748	49	50-75% Grass cover, Fair, HSG A
12,803	79	50-75% Grass cover, Fair, HSG C
12,554	84	50-75% Grass cover, Fair, HSG D
205,440	30	Woods, Good, HSG A
228,765	70	Woods, Good, HSG C
921,630	77	Woods, Good, HSG D
1,467,784	70	Weighted Average
1,413,940		96.33% Pervious Area
53,844		3.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0430	0.25		Sheet Flow, A - B
					Range n= 0.130 P2= 3.00"
0.8	75	0.0510	1.58		Shallow Concentrated Flow, B -C
					Short Grass Pasture Kv= 7.0 fps
20.3	923	0.0230	0.76		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
1.4	547	0.0180	6.31	157.83	Channel Flow, D - E
					Area= 25.0 sf Perim= 27.0' r= 0.93'
					n= 0.030 Earth, grassed & winding
29.1	1,645	Total			

Summary for Subcatchment OS2: OFFSITE SUB 2

Runoff = 35.70 cfs @ 12.80 hrs, Volume= 278,070 cf, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
24,623	98	Paved parking & roofs
8,226	79	50-75% Grass cover, Fair, HSG C
13,667	84	50-75% Grass cover, Fair, HSG D
151,095	70	Woods, Good, HSG C
715,514	77	Woods, Good, HSG D
913,125	77	Weighted Average
888,502		97.30% Pervious Area
24,623		2.70% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0530	0.11		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
43.8	1,554	0.0140	0.59		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
58.8	1,654	Total			

Summary for Subcatchment S3: SUB 3

Runoff = 38.62 cfs @ 12.54 hrs, Volume= 240,602 cf, Depth= 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
304,505	98	Paved parking & roofs
45,477	49	50-75% Grass cover, Fair, HSG A
10,125	79	50-75% Grass cover, Fair, HSG C
78,239	84	50-75% Grass cover, Fair, HSG D
142,893	30	Woods, Good, HSG A
81,209	70	Woods, Good, HSG C
173,668	77	Woods, Good, HSG D
836,116	75	Weighted Average
531,611		63.58% Pervious Area
304,505		36.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.0950	0.15		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.5	143	0.1000	1.58		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
21.3	535	0.0070	0.42		Shallow Concentrated Flow, C -D
					Woodland Kv= 5.0 fps
39.2	828	Total			

Summary for Subcatchment S3.1: SUB 3.1

Runoff = 5.92 cfs @ 12.07 hrs, Volume= 19,781 cf, Depth= 5.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

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Type III 24-hr 25-Yr Rainfall=6.20"

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Area (sf)	CN	Description
36,951	98	Paved parking & roofs
3,700	79	50-75% Grass cover, Fair, HSG C
800	84	50-75% Grass cover, Fair, HSG D
41,451	96	Weighted Average
4,500		10.86% Pervious Area
36,951		89.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	160	0.0100	1.11		Sheet Flow, A - B
					Smooth surfaces n= 0.011 P2= 3.00"
2.6					Direct Entry, Min Tc
5.0	160	Total			

Summary for Subcatchment S3.2: SUB 3.2

Runoff = 0.98 cfs @ 12.07 hrs, Volume= 2,956 cf, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
798	98	Paved parking & roofs
7,924	79	50-75% Grass cover, Fair, HSG C
8,722	81	Weighted Average
7,924		90.85% Pervious Area
798		9.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	163	0.0220	1.04		Shallow Concentrated Flow, A - B
					Short Grass Pasture Kv= 7.0 fps
2.4					Direct Entry,
5.0	163	Total			

Summary for Subcatchment S3.3: SUB 3.3

Runoff = 0.17 cfs @ 12.07 hrs, Volume= 523 cf, Depth= 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
460	98	Paved parking & roofs
1,212	70	Woods, Good, HSG C
1,672	78	Weighted Average
1,212		72.49% Pervious Area
460		27.51% Impervious Area

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Type III 24-hr 25-Yr Rainfall=6.20"

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

Summary for Subcatchment S4: SUB 4

Runoff = 49.13 cfs @ 12.63 hrs, Volume= 334,187 cf, Depth= 3.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
171,450	98	Paved parking & roofs
20,781	79	50-75% Grass cover, Fair, HSG C
7,642	84	50-75% Grass cover, Fair, HSG D
419,188	73	Woods, Fair, HSG C
393,067	79	Woods, Fair, HSG D
1,012,128	80	Weighted Average
840,678		83.06% Pervious Area
171,450		16.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.3	100	0.0100	0.06		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.9	284	0.0600	1.22		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
10.4	341	0.0120	0.55		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
2.6	874	0.0140	5.64	281.88	Channel Flow, D - E
					Area= 50.0 sf Perim= 53.0' r= 0.94'
					n= 0.030 Earth, grassed & winding
46.2	1,599	Total			

Summary for Subcatchment S4.1: SUB 4.1

Runoff = 5.28 cfs @ 12.07 hrs, Volume= 17,879 cf, Depth= 5.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
35,058	98	Paved parking & roofs
1,656	74	>75% Grass cover, Good, HSG C
36,714	97	Weighted Average
1,656		4.51% Pervious Area
35,058		95.49% Impervious Area

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Type III 24-hr 25-Yr Rainfall=6.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	200	0.0100	1.16		Sheet Flow, A - B Smooth surfaces n= 0.011 P2= 3.00"
0.7	81	0.0100	2.03		Shallow Concentrated Flow, B - C Paved Kv= 20.3 fps
1.4					Direct Entry, Min Tc
5.0	281	Total			

Summary for Subcatchment S6: SUB 6

Runoff = 11.37 cfs @ 12.18 hrs, Volume= 44,961 cf, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
10,824	98	Paved parking & roofs
19,401	79	50-75% Grass cover, Fair, HSG C
64,092	84	50-75% Grass cover, Fair, HSG D
32,603	70	Woods, Good, HSG C
5,760	77	Woods, Good, HSG D
132,680	81	Weighted Average
121,856		91.84% Pervious Area
10,824		8.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	40	0.0410	0.08		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	71	0.1120	1.67		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
4.5	265	0.0380	0.97		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
0.3	240	0.0250	11.44	686.23	Channel Flow, C - D Area= 60.0 sf Perim= 34.0' r= 1.76' n= 0.030 Earth, grassed & winding
13.5	616	Total			

Summary for Subcatchment S7: SUB 3

Runoff = 18.60 cfs @ 12.14 hrs, Volume= 68,622 cf, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

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Type III 24-hr 25-Yr Rainfall=6.20"

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Area (sf)	CN	Description
72,236	98	Paved parking & roofs
66,092	84	50-75% Grass cover, Fair, HSG D
5,176	73	Woods, Fair, HSG C
23,549	79	Woods, Fair, HSG D
167,053	89	Weighted Average
94,817		56.76% Pervious Area
72,236		43.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	58	0.0430	0.20		Sheet Flow, A - B Grass: Short n= 0.150 P2= 3.00"
1.1	136	0.0840	2.03		Shallow Concentrated Flow, B - C Short Grass Pasture Kv= 7.0 fps
2.8	424	0.0150	2.49		Shallow Concentrated Flow, C - D Paved Kv= 20.3 fps
0.1	39	0.0450	9.55	3.33	Pipe Channel, D - E 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
0.3	185	0.0380	11.66	116.60	Channel Flow, E - F Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.5	137	0.0168	4.82	0.95	Pipe Channel, F - G 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
0.4	102	0.0042	4.67	14.66	Pipe Channel, G - H 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
10.0	1,081	Total			

Summary for Subcatchment S8: SUB 8

Runoff = 5.45 cfs @ 12.29 hrs, Volume= 25,620 cf, Depth= 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
4,122	98	Paved parking & roofs
439	79	50-75% Grass cover, Fair, HSG C
34,658	74	>75% Grass cover, Good, HSG C
4,166	73	Woods, Fair, HSG C
38,464	79	Woods, Fair, HSG D
81,849	78	Weighted Average
77,727		94.96% Pervious Area
4,122		5.04% Impervious Area

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Type III 24-hr 25-Yr Rainfall=6.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	120	0.0500	0.11		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
1.4	138	0.1100	1.66		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
1.9	141	0.0320	1.25		Shallow Concentrated Flow, C - D Short Grass Pasture Kv= 7.0 fps
21.1	399	Total			

Summary for Reach R1: REACH 1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 2.96" for 25-Yr event
 Inflow = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf
 Outflow = 14.59 cfs @ 13.42 hrs, Volume= 362,621 cf, Atten= 0%, Lag= 7.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.59 fps, Min. Travel Time= 4.0 min
 Avg. Velocity = 0.59 fps, Avg. Travel Time= 10.9 min

Peak Storage= 3,536 cf @ 13.35 hrs
 Average Depth at Peak Storage= 0.27'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 256.49 cfs

100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
 Length= 386.0' Slope= 0.0104 '/'
 Inlet Invert= 30.00', Outlet Invert= 26.00'

**Summary for Reach R2: REACH 2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 3.65" for 25-Yr event
 Inflow = 18.37 cfs @ 13.45 hrs, Volume= 278,064 cf
 Outflow = 18.35 cfs @ 13.60 hrs, Volume= 278,063 cf, Atten= 0%, Lag= 9.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.69 fps, Min. Travel Time= 5.2 min
 Avg. Velocity = 0.51 fps, Avg. Travel Time= 17.1 min

Peak Storage= 5,722 cf @ 13.51 hrs
 Average Depth at Peak Storage= 0.30'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 252.44 cfs

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Type III 24-hr 25-Yr Rainfall=6.20"

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100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 527.0' Slope= 0.0100 '/'
Inlet Invert= 31.29', Outlet Invert= 26.00'



Summary for Reach R3: REACH 3

Inflow Area = 2,380,909 sf, 3.30% Impervious, Inflow Depth = 3.23" for 25-Yr event
Inflow = 32.93 cfs @ 13.57 hrs, Volume= 640,684 cf
Outflow = 32.92 cfs @ 13.66 hrs, Volume= 640,681 cf, Atten= 0%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.63 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 10.0 min

Peak Storage= 6,222 cf @ 13.61 hrs
Average Depth at Peak Storage= 0.91'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 141.56 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 874.0' Slope= 0.0138 '/'
Inlet Invert= 26.00', Outlet Invert= 13.90'



Summary for Reach R3.1: REACH 3.1

Inflow Area = 51,845 sf, 73.70% Impervious, Inflow Depth = 5.38" for 25-Yr event
Inflow = 2.89 cfs @ 12.27 hrs, Volume= 23,260 cf
Outflow = 2.70 cfs @ 12.38 hrs, Volume= 23,260 cf, Atten= 7%, Lag= 7.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.76 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 8.5 min

Peak Storage= 638 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 833.80 cfs

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50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 179.0' Slope= 0.0056 '/'
Inlet Invert= 24.90', Outlet Invert= 23.90'



Summary for Reach R3.2: REACH 3.2

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 4.02" for 25-Yr event
Inflow = 1.16 cfs @ 12.07 hrs, Volume= 3,479 cf
Outflow = 1.13 cfs @ 12.12 hrs, Volume= 3,479 cf, Atten= 3%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.84 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 2.3 min

Peak Storage= 123 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 1,651.08 cfs

50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 91.3' Slope= 0.0219 '/'
Inlet Invert= 26.90', Outlet Invert= 24.90'



Summary for Reach R4: REACH 4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 3.78" for 25-Yr event
Inflow = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf
Outflow = 48.14 cfs @ 12.58 hrs, Volume= 358,096 cf, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.59 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.79 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1,241 cf @ 12.57 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 157.25 cfs

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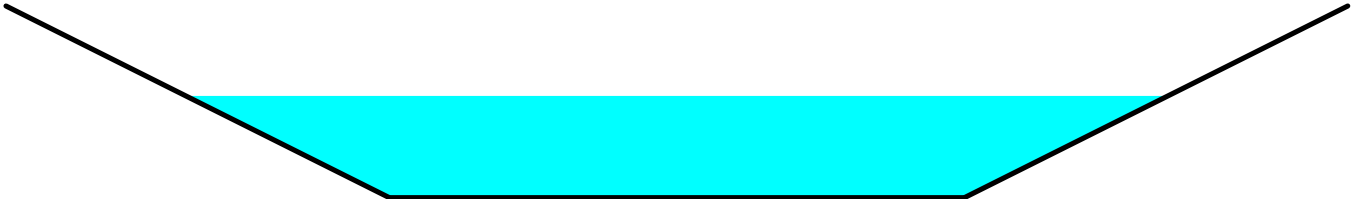
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6.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 14.00'

Length= 144.0' Slope= 0.0171 ' '

Inlet Invert= 16.36', Outlet Invert= 13.90'



Summary for Reach R4.1: REACH 4.1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 5.84" for 25-Yr event
Inflow = 3.99 cfs @ 12.13 hrs, Volume= 17,880 cf
Outflow = 3.05 cfs @ 12.30 hrs, Volume= 17,880 cf, Atten= 24%, Lag= 9.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 1.57 fps, Min. Travel Time= 5.8 min

Avg. Velocity = 0.53 fps, Avg. Travel Time= 17.3 min

Peak Storage= 1,072 cf @ 12.20 hrs

Average Depth at Peak Storage= 0.15'

Bank-Full Depth= 2.00' Flow Area= 56.0 sf, Capacity= 390.71 cfs

12.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 8.0 ' ' Top Width= 44.00'

Length= 552.0' Slope= 0.0145 ' '

Inlet Invert= 22.00', Outlet Invert= 14.00'



Summary for Reach R5: REACH 5

Inflow Area = 4,566,614 sf, 15.42% Impervious, Inflow Depth = 3.55" for 25-Yr event
Inflow = 119.32 cfs @ 12.63 hrs, Volume= 1,350,844 cf
Outflow = 119.28 cfs @ 12.65 hrs, Volume= 1,350,843 cf, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 7.72 fps, Min. Travel Time= 0.7 min

Avg. Velocity = 1.92 fps, Avg. Travel Time= 2.8 min

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Peak Storage= 4,900 cf @ 12.64 hrs

Average Depth at Peak Storage= 1.80'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 147.04 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 13.00'

Length= 317.0' Slope= 0.0134 ' '

Inlet Invert= 13.90', Outlet Invert= 9.64'



Summary for Reach R6: REACH 6

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 3.58" for 25-Yr event

Inflow = 43.76 cfs @ 12.55 hrs, Volume= 289,481 cf

Outflow = 43.76 cfs @ 12.56 hrs, Volume= 289,481 cf, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 5.82 fps, Min. Travel Time= 0.4 min

Avg. Velocity = 1.67 fps, Avg. Travel Time= 1.3 min

Peak Storage= 999 cf @ 12.56 hrs

Average Depth at Peak Storage= 0.42'

Bank-Full Depth= 2.00' Flow Area= 42.0 sf, Capacity= 623.19 cfs

17.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 2.0 ' ' Top Width= 25.00'

Length= 133.0' Slope= 0.0328 ' '

Inlet Invert= 23.90', Outlet Invert= 19.54'



Summary for Pond AP3: 4 - 24"CMP

Inflow Area = 4,699,294 sf, 15.21% Impervious, Inflow Depth = 3.56" for 25-Yr event

Inflow = 122.30 cfs @ 12.64 hrs, Volume= 1,395,804 cf

Outflow = 99.79 cfs @ 13.01 hrs, Volume= 1,395,789 cf, Atten= 18%, Lag= 22.7 min

Primary = 99.79 cfs @ 13.01 hrs, Volume= 1,395,789 cf

Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 6

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Peak Elev= 15.68' @ 13.01 hrs Surf.Area= 34,929 sf Storage= 63,392 cf

Plug-Flow detention time= 4.1 min calculated for 1,395,789 cf (100% of inflow)

Center-of-Mass det. time= 4.0 min (904.9 - 900.8)

Volume	Invert	Avail.Storage	Storage Description
#1	9.64'	96,037 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.64	0	0	0
10.00	856	154	154
12.00	4,037	4,893	5,047
14.00	13,588	17,625	22,672
16.00	39,016	52,604	75,276
16.50	44,026	20,761	96,037

Device	Routing	Invert	Outlet Devices
#1	Primary	9.77'	24.0" Round Proposed 3 - 24" CMP X 3.00 L= 65.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.12' S= 0.0100 ' / Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Primary	9.83'	24.0" Round Existing 24" CMP L= 64.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.83' S= -0.0009 ' / Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#3	Secondary	16.50'	20.0' long x 25.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=99.79 cfs @ 13.01 hrs HW=15.68' (Free Discharge)↑ **1=Proposed 3 - 24" CMP** (Barrel Controls 76.16 cfs @ 8.08 fps)↑ **2=Existing 24" CMP** (Barrel Controls 23.63 cfs @ 7.52 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=9.64' (Free Discharge)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond C3: CULV-3**

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 2.96" for 25-Yr event
 Inflow = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf
 Outflow = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf, Atten= 0%, Lag= 0.0 min
 Primary = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.42' @ 13.30 hrs

Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.60'	24.0" Round Culvert L= 169.0' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 31.60' / 30.00' S= 0.0095 ' /' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 3.14 sf

Primary OutFlow Max=14.59 cfs @ 13.30 hrs HW=33.42' TW=31.60' (Fixed TW Elev= 31.60')

↑**1=Culvert** (Outlet Controls 14.59 cfs @ 6.37 fps)

Summary for Pond C4: CULV-4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 3.78" for 25-Yr event
 Inflow = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf
 Outflow = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf, Atten= 0%, Lag= 0.0 min
 Primary = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 25.56' @ 12.56 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.79'	24.0" Round Culvert L= 86.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 16.79' / 16.36' S= 0.0050 ' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=48.19 cfs @ 12.56 hrs HW=25.55' (Free Discharge)

↑**1=Culvert** (Barrel Controls 48.19 cfs @ 15.34 fps)

Summary for Pond C7: CULV-7

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 3.58" for 25-Yr event
 Inflow = 43.76 cfs @ 12.56 hrs, Volume= 289,481 cf
 Outflow = 43.72 cfs @ 12.58 hrs, Volume= 289,474 cf, Atten= 0%, Lag= 0.8 min
 Primary = 32.92 cfs @ 12.58 hrs, Volume= 280,765 cf
 Secondary = 10.80 cfs @ 12.58 hrs, Volume= 8,708 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 23.47' @ 12.58 hrs Surf.Area= 7,070 sf Storage= 9,483 cf

Plug-Flow detention time= 1.7 min calculated for 289,474 cf (100% of inflow)
 Center-of-Mass det. time= 1.6 min (859.9 - 858.3)

Volume	Invert	Avail.Storage	Storage Description
#1	19.54'	9,728 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.54	0	0	0
20.00	144	33	33
21.00	890	517	550
22.00	2,015	1,453	2,003
23.00	6,588	4,302	6,304
23.50	7,106	3,424	9,728

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Device	Routing	Invert	Outlet Devices
#1	Primary	19.54'	24.0" Round 24" RCP L= 184.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 19.54' / 16.79' S= 0.0149 ' S= 0.0149 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	23.40'	250.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=32.92 cfs @ 12.58 hrs HW=23.47' (Free Discharge)↑**1=24" RCP** (Barrel Controls 32.92 cfs @ 10.48 fps)**Secondary OutFlow** Max=10.64 cfs @ 12.58 hrs HW=23.47' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 10.64 cfs @ 0.65 fps)**Summary for Pond CB5: CB-5**

Inflow Area = 1,672 sf, 27.51% Impervious, Inflow Depth = 3.76" for 25-Yr event
 Inflow = 0.17 cfs @ 12.07 hrs, Volume= 523 cf
 Outflow = 0.17 cfs @ 12.07 hrs, Volume= 523 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 12.07 hrs, Volume= 523 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 629.89' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	29.50'	1.0" Round 12" CULV L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.50' / 29.15' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.01 sf

Primary OutFlow Max=0.17 cfs @ 12.07 hrs HW=627.27' (Free Discharge)↑**1=12" CULV** (Barrel Controls 0.17 cfs @ 32.00 fps)**Summary for Pond CB6: CB-6**

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 4.02" for 25-Yr event
 Inflow = 1.16 cfs @ 12.07 hrs, Volume= 3,479 cf
 Outflow = 1.16 cfs @ 12.07 hrs, Volume= 3,479 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.16 cfs @ 12.07 hrs, Volume= 3,479 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 28.46' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.82'	12.0" Round 12"SD L= 184.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 27.82' / 26.90' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 0.79 sf

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Primary OutFlow Max=1.15 cfs @ 12.07 hrs HW=28.46' (Free Discharge)

↑1=12"SD (Barrel Controls 1.15 cfs @ 3.11 fps)

Summary for Pond DMH-1: DMH-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 5.84" for 25-Yr event
 Inflow = 5.28 cfs @ 12.07 hrs, Volume= 17,879 cf
 Outflow = 5.28 cfs @ 12.07 hrs, Volume= 17,879 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.28 cfs @ 12.07 hrs, Volume= 17,879 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.68' @ 12.07 hrs

Flood Elev= 36.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.58'	24.0" Round 24" SD to Detention Bed L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 32.58' / 32.35' S= 0.0077 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=5.28 cfs @ 12.07 hrs HW=33.68' (Free Discharge)

↑1=24" SD to Detention Bed (Barrel Controls 5.28 cfs @ 4.30 fps)

Summary for Pond DMH-6: DMH-6

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 5.73" for 25-Yr event
 Inflow = 5.92 cfs @ 12.07 hrs, Volume= 19,781 cf
 Outflow = 5.92 cfs @ 12.07 hrs, Volume= 19,781 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.92 cfs @ 12.07 hrs, Volume= 19,781 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 31.19' @ 12.07 hrs

Flood Elev= 32.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	30.13'	24.0" Round 24" SD to Detention Bed L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 30.13' / 28.90' S= 0.2050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=5.92 cfs @ 12.07 hrs HW=31.19' (Free Discharge)

↑1=24" SD to Detention Bed (Inlet Controls 5.92 cfs @ 3.50 fps)

Summary for Pond OC1: OFFSITE CULV-1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 2.96" for 25-Yr event
 Inflow = 66.68 cfs @ 12.41 hrs, Volume= 362,632 cf
 Outflow = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf, Atten= 78%, Lag= 53.2 min
 Primary = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf

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Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 36.95' @ 13.30 hrs Surf.Area= 100,691 sf Storage= 143,927 cf

Plug-Flow detention time= 116.1 min calculated for 362,623 cf (100% of inflow)

Center-of-Mass det. time= 116.1 min (974.1 - 858.0)

Volume	Invert	Avail.Storage	Storage Description
#1	34.25'	602,689 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.25	5,289	0	0
36.00	67,698	63,864	63,864
38.00	137,090	204,788	268,652
40.00	196,947	334,037	602,689

Device	Routing	Invert	Outlet Devices
#1	Primary	34.25'	18.0" Round 18" RCP L= 97.6' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 34.25' / 32.29' S= 0.0201 ' S= 0.0201 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=14.59 cfs @ 13.30 hrs HW=36.95' (Free Discharge)↑**1=18" RCP** (Barrel Controls 14.59 cfs @ 8.26 fps)**Summary for Pond OC2: OFFSITE CULV-2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 3.65" for 25-Yr event

Inflow = 35.70 cfs @ 12.80 hrs, Volume= 278,070 cf

Outflow = 18.37 cfs @ 13.45 hrs, Volume= 278,064 cf, Atten= 49%, Lag= 39.0 min

Primary = 18.37 cfs @ 13.45 hrs, Volume= 278,064 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 37.67' @ 13.45 hrs Surf.Area= 27,561 sf Storage= 62,087 cf

Plug-Flow detention time= 37.3 min calculated for 278,064 cf (100% of inflow)

Center-of-Mass det. time= 37.3 min (906.4 - 869.1)

Volume	Invert	Avail.Storage	Storage Description
#1	32.88'	71,548 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.88	5,285	0	0
34.00	8,520	7,731	7,731
36.00	12,392	20,912	28,643
38.00	30,513	42,905	71,548

Device	Routing	Invert	Outlet Devices
#1	Primary	32.88'	18.0" Round 18" RCP L= 93.6' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 32.88' / 31.29' S= 0.0170 ' / ' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=18.37 cfs @ 13.45 hrs HW=37.67' (Free Discharge)

↑ **1=18" RCP** (Barrel Controls 18.37 cfs @ 10.39 fps)

Summary for Pond P3.1: STORMTECH DETENTION / OCS-2

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 5.73" for 25-Yr event
 Inflow = 5.92 cfs @ 12.07 hrs, Volume= 19,781 cf
 Outflow = 2.30 cfs @ 12.27 hrs, Volume= 19,781 cf, Atten= 61%, Lag= 12.2 min
 Primary = 2.30 cfs @ 12.27 hrs, Volume= 19,781 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 31.08' @ 12.27 hrs Surf.Area= 3,328 sf Storage= 7,136 cf

Flood Elev= 31.21' Surf.Area= 3,328 sf Storage= 7,258 cf

Plug-Flow detention time= 129.2 min calculated for 19,781 cf (100% of inflow)

Center-of-Mass det. time= 129.2 min (885.7 - 756.6)

Volume	Invert	Avail.Storage	Storage Description
#1	27.67'	2,926 cf	34.70'W x 95.90'L x 3.50'H Prismatic 11,647 cf Overall - 4,331 cf Embedded = 7,316 cf x 40.0% Voids
#2	28.17'	4,331 cf	ADS_StormTech SC-740 @ 95.90' L x 7 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 95.90'L = 618.8 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		7,258 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	25.15'	24.0" Round 24" SD L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 25.15' / 25.00' S= 0.0100 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	25.15'	2.0" Vert. 2" Orifice C= 0.600
#3	Device 1	29.12'	4.0" Vert. 4" Orifice C= 0.600
#4	Device 1	30.90'	6.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=2.30 cfs @ 12.27 hrs HW=31.08' (Free Discharge)

↑ **1=24" SD** (Passes 2.30 cfs of 26.51 cfs potential flow)

↑ **2=2" Orifice** (Orifice Controls 0.25 cfs @ 11.64 fps)

↑ **3=4" Orifice** (Orifice Controls 0.56 cfs @ 6.44 fps)

↑ **4=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.48 cfs @ 1.38 fps)

Summary for Pond P4.1: STORMTECH DETENTION / OCS-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 5.84" for 25-Yr event
 Inflow = 5.28 cfs @ 12.07 hrs, Volume= 17,879 cf
 Outflow = 3.99 cfs @ 12.13 hrs, Volume= 17,880 cf, Atten= 24%, Lag= 3.8 min
 Primary = 3.99 cfs @ 12.13 hrs, Volume= 17,880 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

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Peak Elev= 33.95' @ 12.13 hrs Surf.Area= 1,702 sf Storage= 2,637 cf
 Flood Elev= 34.78' Surf.Area= 1,702 sf Storage= 3,388 cf

Plug-Flow detention time= 9.3 min calculated for 17,876 cf (100% of inflow)
 Center-of-Mass det. time= 9.3 min (759.9 - 750.6)

Volume	Invert	Avail.Storage	Storage Description
#1	31.72'	1,513 cf	25.25'W x 67.40'L x 3.50'H Prismatic 5,956 cf Overall - 2,174 cf Embedded = 3,782 cf x 40.0% Voids
#2	32.22'	2,174 cf	ADS_StormTech SC-740 @ 67.40' L x 5 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 67.40'L = 434.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		3,687 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	28.76'	24.0" Round 24" SD L= 268.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 28.76' / 22.00' S= 0.0252 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	28.76'	4.0" Vert. 4" Orifice C= 0.600
#3	Device 1	32.90'	6.0" Vert. 6" Orifice C= 0.600
#4	Device 1	33.65'	4.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=3.98 cfs @ 12.13 hrs HW=33.95' (Free Discharge)

- 1=24" SD (Passes 3.98 cfs of 24.45 cfs potential flow)
- 2=4" Orifice (Orifice Controls 0.94 cfs @ 10.80 fps)
- 3=6" Orifice (Orifice Controls 0.85 cfs @ 4.32 fps)
- 4=Sharp-Crested Vee/Trap Weir (Weir Controls 2.19 cfs @ 1.80 fps)

Summary for Pond W: WETLAND

Inflow Area = 917,965 sf, 33.62% Impervious, Inflow Depth = 3.48" for 25-Yr event
 Inflow = 42.30 cfs @ 12.50 hrs, Volume= 266,221 cf
 Outflow = 41.85 cfs @ 12.57 hrs, Volume= 266,221 cf, Atten= 1%, Lag= 3.7 min
 Primary = 41.85 cfs @ 12.57 hrs, Volume= 266,221 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 24.68' @ 12.57 hrs Surf.Area= 14,582 sf Storage= 5,150 cf

Plug-Flow detention time= 1.1 min calculated for 266,166 cf (100% of inflow)
 Center-of-Mass det. time= 1.1 min (854.6 - 853.4)

Volume	Invert	Avail.Storage	Storage Description
#1	23.90'	42,267 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.90	0	0	0
24.00	412	21	21
26.00	41,834	42,246	42,267

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Device	Routing	Invert	Outlet Devices
#1	Primary	23.90'	152.0 deg x 17.0' long Sharp-Crested Vee/Trap Weir Cv= 2.47 (C= 3.09)

Primary OutFlow Max=41.84 cfs @ 12.57 hrs HW=24.68' (Free Discharge)

↑**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 41.84 cfs @ 2.65 fps)

Summary for Link AP1: AP 1

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 3.78" for 25-Yr event
Inflow = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf
Primary = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP2: AP 2

Inflow Area = 4,699,294 sf, 15.21% Impervious, Inflow Depth = 3.56" for 25-Yr event
Inflow = 99.79 cfs @ 13.01 hrs, Volume= 1,395,789 cf
Primary = 99.79 cfs @ 13.01 hrs, Volume= 1,395,789 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment OS1: OFFSITE SUB 1 Runoff Area=1,467,784 sf 3.67% Impervious Runoff Depth=3.87"
Flow Length=1,645' Tc=29.1 min CN=70 Runoff=87.48 cfs 473,256 cf

Subcatchment OS2: OFFSITE SUB 2 Runoff Area=913,125 sf 2.70% Impervious Runoff Depth=4.64"
Flow Length=1,654' Tc=58.8 min CN=77 Runoff=45.22 cfs 352,800 cf

Subcatchment S3: SUB 3 Runoff Area=836,116 sf 36.42% Impervious Runoff Depth=4.41"
Flow Length=828' Tc=39.2 min CN=75 Runoff=49.36 cfs 307,609 cf

Subcatchment S3.1: SUB 3.1 Runoff Area=41,451 sf 89.14% Impervious Runoff Depth=6.82"
Flow Length=160' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=7.00 cfs 23,567 cf

Subcatchment S3.2: SUB 3.2 Runoff Area=8,722 sf 9.15% Impervious Runoff Depth=5.08"
Flow Length=163' Slope=0.0220 '/' Tc=5.0 min CN=81 Runoff=1.22 cfs 3,696 cf

Subcatchment S3.3: SUB 3.3 Runoff Area=1,672 sf 27.51% Impervious Runoff Depth=4.75"
Tc=5.0 min CN=78 Runoff=0.22 cfs 662 cf

Subcatchment S4: SUB 4 Runoff Area=1,012,128 sf 16.94% Impervious Runoff Depth=4.97"
Flow Length=1,599' Tc=46.2 min CN=80 Runoff=61.36 cfs 419,362 cf

Subcatchment S4.1: SUB 4.1 Runoff Area=36,714 sf 95.49% Impervious Runoff Depth=6.94"
Flow Length=281' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=6.23 cfs 21,238 cf

Subcatchment S6: SUB 6 Runoff Area=132,680 sf 8.16% Impervious Runoff Depth=5.08"
Flow Length=616' Tc=13.5 min CN=81 Runoff=14.13 cfs 56,221 cf

Subcatchment S7: SUB 3 Runoff Area=167,053 sf 43.24% Impervious Runoff Depth=6.00"
Flow Length=1,081' Tc=10.0 min CN=89 Runoff=22.41 cfs 83,543 cf

Subcatchment S8: SUB 8 Runoff Area=81,849 sf 5.04% Impervious Runoff Depth=4.75"
Flow Length=399' Tc=21.1 min CN=78 Runoff=6.87 cfs 32,384 cf

Reach R1: REACH 1 Avg. Flow Depth=0.28' Max Vel=1.63 fps Inflow=15.78 cfs 473,246 cf
n=0.030 L=386.0' S=0.0104 '/' Capacity=256.49 cfs Outflow=15.78 cfs 473,244 cf

Reach R2: REACH 2 Avg. Flow Depth=0.40' Max Vel=2.07 fps Inflow=45.49 cfs 352,800 cf
n=0.030 L=527.0' S=0.0100 '/' Capacity=252.44 cfs Outflow=35.27 cfs 352,800 cf

Reach R3: REACH 3 Avg. Flow Depth=1.15' Max Vel=5.26 fps Inflow=50.95 cfs 826,044 cf
n=0.030 L=874.0' S=0.0138 '/' Capacity=141.56 cfs Outflow=50.29 cfs 826,043 cf

Reach R3.1: REACH 3.1 Avg. Flow Depth=0.10' Max Vel=0.94 fps Inflow=6.73 cfs 27,763 cf
n=0.025 L=179.0' S=0.0056 '/' Capacity=833.80 cfs Outflow=4.81 cfs 27,763 cf

Reach R3.2: REACH 3.2 Avg. Flow Depth=0.03' Max Vel=0.91 fps Inflow=1.44 cfs 4,357 cf
n=0.025 L=91.3' S=0.0219 '/' Capacity=1,651.08 cfs Outflow=1.40 cfs 4,357 cf

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Reach R4: REACH 4 Avg. Flow Depth=1.22' Max Vel=6.02 fps Inflow=61.80 cfs 451,402 cf
n=0.030 L=144.0' S=0.0171 '/' Capacity=157.25 cfs Outflow=61.80 cfs 451,402 cf

Reach R4.1: REACH 4.1 Avg. Flow Depth=0.18' Max Vel=1.77 fps Inflow=5.53 cfs 21,238 cf
n=0.030 L=552.0' S=0.0145 '/' Capacity=390.71 cfs Outflow=4.29 cfs 21,238 cf

Reach R5: REACH 5 Avg. Flow Depth=2.01' Max Vel=8.19 fps Inflow=148.19 cfs 1,718,045 cf
n=0.025 L=317.0' S=0.0134 '/' Capacity=147.04 cfs Outflow=148.18 cfs 1,718,045 cf

Reach R6: REACH 6 Avg. Flow Depth=0.49' Max Vel=6.37 fps Inflow=55.52 cfs 367,756 cf
n=0.025 L=133.0' S=0.0328 '/' Capacity=623.19 cfs Outflow=55.51 cfs 367,756 cf

Pond AP3: 4 - 24"CMP Peak Elev=17.32' Storage=96,037 cf Inflow=152.41 cfs 1,774,265 cf
Primary=116.94 cfs 1,760,487 cf Secondary=38.95 cfs 23,892 cf Outflow=155.89 cfs 1,784,380 cf

Pond C3: CULV-3 Peak Elev=33.51' Inflow=15.78 cfs 473,246 cf
24.0" Round Culvert n=0.013 L=169.0' S=0.0095 '/' Outflow=15.78 cfs 473,246 cf

Pond C4: CULV-4 Peak Elev=30.18' Inflow=61.80 cfs 451,402 cf
24.0" Round Culvert n=0.011 L=86.0' S=0.0050 '/' Outflow=61.80 cfs 451,402 cf

Pond C7: CULV-7 Peak Elev=23.51' Storage=9,728 cf Inflow=55.51 cfs 367,756 cf
Primary=33.07 cfs 335,031 cf Secondary=22.56 cfs 32,828 cf Outflow=55.63 cfs 367,860 cf

Pond CB5: CB-5 Peak Elev=979.45' Inflow=0.22 cfs 662 cf
1.0" Round Culvert n=0.010 L=70.0' S=0.0050 '/' Outflow=0.22 cfs 662 cf

Pond CB6: CB-6 Peak Elev=28.55' Inflow=1.44 cfs 4,357 cf
12.0" Round Culvert n=0.013 L=184.0' S=0.0050 '/' Outflow=1.44 cfs 4,357 cf

Pond DMH-1: DMH-1 Peak Elev=33.80' Inflow=6.23 cfs 21,238 cf
24.0" Round Culvert n=0.010 L=30.0' S=0.0077 '/' Outflow=6.23 cfs 21,238 cf

Pond DMH-6: DMH-6 Peak Elev=31.30' Inflow=7.00 cfs 23,567 cf
24.0" Round Culvert n=0.010 L=6.0' S=0.2050 '/' Outflow=7.00 cfs 23,567 cf

Pond OC1: OFFSITE CULV-1 Peak Elev=37.48' Storage=202,628 cf Inflow=87.48 cfs 473,256 cf
18.0" Round Culvert n=0.013 L=97.6' S=0.0201 '/' Outflow=15.78 cfs 473,246 cf

Pond OC2: OFFSITE CULV-2 Peak Elev=62.75' Storage=71,548 cf Inflow=45.22 cfs 352,800 cf
18.0" Round Culvert n=0.013 L=93.6' S=0.0170 '/' Outflow=45.49 cfs 352,800 cf

Pond P3.1: STORMTECH DETENTION / Peak Elev=31.27' Storage=7,258 cf Inflow=7.00 cfs 23,567 cf
Outflow=5.33 cfs 23,406 cf

Pond P4.1: STORMTECH DETENTION / Peak Elev=34.08' Storage=2,775 cf Inflow=6.23 cfs 21,238 cf
Outflow=5.53 cfs 21,238 cf

Pond W: WETLAND Peak Elev=24.81' Storage=7,143 cf Inflow=54.03 cfs 339,993 cf
Outflow=53.36 cfs 339,993 cf

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Type III 24-hr 50-Yr Rainfall=7.30"

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Link AP1: AP 1

Inflow=61.80 cfs 451,402 cf

Primary=61.80 cfs 451,402 cf

Link AP2: AP 2

Inflow=155.89 cfs 1,784,380 cf

Primary=155.89 cfs 1,784,380 cf

Total Runoff Area = 4,699,294 sf Runoff Volume = 1,774,337 cf Average Runoff Depth = 4.53"
84.79% Pervious = 3,984,423 sf 15.21% Impervious = 714,871 sf

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Type III 24-hr 50-Yr Rainfall=7.30"

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Summary for Subcatchment OS1: OFFSITE SUB 1

Runoff = 87.48 cfs @ 12.41 hrs, Volume= 473,256 cf, Depth= 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
53,844	98	Paved parking & roofs
32,748	49	50-75% Grass cover, Fair, HSG A
12,803	79	50-75% Grass cover, Fair, HSG C
12,554	84	50-75% Grass cover, Fair, HSG D
205,440	30	Woods, Good, HSG A
228,765	70	Woods, Good, HSG C
921,630	77	Woods, Good, HSG D
1,467,784	70	Weighted Average
1,413,940		96.33% Pervious Area
53,844		3.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0430	0.25		Sheet Flow, A - B
					Range n= 0.130 P2= 3.00"
0.8	75	0.0510	1.58		Shallow Concentrated Flow, B -C
					Short Grass Pasture Kv= 7.0 fps
20.3	923	0.0230	0.76		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
1.4	547	0.0180	6.31	157.83	Channel Flow, D - E
					Area= 25.0 sf Perim= 27.0' r= 0.93'
					n= 0.030 Earth, grassed & winding
29.1	1,645	Total			

Summary for Subcatchment OS2: OFFSITE SUB 2

Runoff = 45.22 cfs @ 12.80 hrs, Volume= 352,800 cf, Depth= 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
24,623	98	Paved parking & roofs
8,226	79	50-75% Grass cover, Fair, HSG C
13,667	84	50-75% Grass cover, Fair, HSG D
151,095	70	Woods, Good, HSG C
715,514	77	Woods, Good, HSG D
913,125	77	Weighted Average
888,502		97.30% Pervious Area
24,623		2.70% Impervious Area

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Type III 24-hr 50-Yr Rainfall=7.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0530	0.11		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
43.8	1,554	0.0140	0.59		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
58.8	1,654	Total			

Summary for Subcatchment S3: SUB 3

Runoff = 49.36 cfs @ 12.54 hrs, Volume= 307,609 cf, Depth= 4.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
304,505	98	Paved parking & roofs
45,477	49	50-75% Grass cover, Fair, HSG A
10,125	79	50-75% Grass cover, Fair, HSG C
78,239	84	50-75% Grass cover, Fair, HSG D
142,893	30	Woods, Good, HSG A
81,209	70	Woods, Good, HSG C
173,668	77	Woods, Good, HSG D
836,116	75	Weighted Average
531,611		63.58% Pervious Area
304,505		36.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.0950	0.15		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.5	143	0.1000	1.58		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
21.3	535	0.0070	0.42		Shallow Concentrated Flow, C -D
					Woodland Kv= 5.0 fps
39.2	828	Total			

Summary for Subcatchment S3.1: SUB 3.1

Runoff = 7.00 cfs @ 12.07 hrs, Volume= 23,567 cf, Depth= 6.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

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Type III 24-hr 50-Yr Rainfall=7.30"

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Area (sf)	CN	Description
36,951	98	Paved parking & roofs
3,700	79	50-75% Grass cover, Fair, HSG C
800	84	50-75% Grass cover, Fair, HSG D
41,451	96	Weighted Average
4,500		10.86% Pervious Area
36,951		89.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	160	0.0100	1.11		Sheet Flow, A - B
					Smooth surfaces n= 0.011 P2= 3.00"
2.6					Direct Entry, Min Tc
5.0	160	Total			

Summary for Subcatchment S3.2: SUB 3.2

Runoff = 1.22 cfs @ 12.07 hrs, Volume= 3,696 cf, Depth= 5.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
798	98	Paved parking & roofs
7,924	79	50-75% Grass cover, Fair, HSG C
8,722	81	Weighted Average
7,924		90.85% Pervious Area
798		9.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	163	0.0220	1.04		Shallow Concentrated Flow, A - B
					Short Grass Pasture Kv= 7.0 fps
2.4					Direct Entry,
5.0	163	Total			

Summary for Subcatchment S3.3: SUB 3.3

Runoff = 0.22 cfs @ 12.07 hrs, Volume= 662 cf, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
460	98	Paved parking & roofs
1,212	70	Woods, Good, HSG C
1,672	78	Weighted Average
1,212		72.49% Pervious Area
460		27.51% Impervious Area

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Type III 24-hr 50-Yr Rainfall=7.30"

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

Summary for Subcatchment S4: SUB 4

Runoff = 61.36 cfs @ 12.63 hrs, Volume= 419,362 cf, Depth= 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
171,450	98	Paved parking & roofs
20,781	79	50-75% Grass cover, Fair, HSG C
7,642	84	50-75% Grass cover, Fair, HSG D
419,188	73	Woods, Fair, HSG C
393,067	79	Woods, Fair, HSG D
1,012,128	80	Weighted Average
840,678		83.06% Pervious Area
171,450		16.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.3	100	0.0100	0.06		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.9	284	0.0600	1.22		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
10.4	341	0.0120	0.55		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
2.6	874	0.0140	5.64	281.88	Channel Flow, D - E
					Area= 50.0 sf Perim= 53.0' r= 0.94'
					n= 0.030 Earth, grassed & winding
46.2	1,599	Total			

Summary for Subcatchment S4.1: SUB 4.1

Runoff = 6.23 cfs @ 12.07 hrs, Volume= 21,238 cf, Depth= 6.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
35,058	98	Paved parking & roofs
1,656	74	>75% Grass cover, Good, HSG C
36,714	97	Weighted Average
1,656		4.51% Pervious Area
35,058		95.49% Impervious Area

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Type III 24-hr 50-Yr Rainfall=7.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	200	0.0100	1.16		Sheet Flow, A - B Smooth surfaces n= 0.011 P2= 3.00"
0.7	81	0.0100	2.03		Shallow Concentrated Flow, B - C Paved Kv= 20.3 fps
1.4					Direct Entry, Min Tc
5.0	281	Total			

Summary for Subcatchment S6: SUB 6

Runoff = 14.13 cfs @ 12.18 hrs, Volume= 56,221 cf, Depth= 5.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
10,824	98	Paved parking & roofs
19,401	79	50-75% Grass cover, Fair, HSG C
64,092	84	50-75% Grass cover, Fair, HSG D
32,603	70	Woods, Good, HSG C
5,760	77	Woods, Good, HSG D
132,680	81	Weighted Average
121,856		91.84% Pervious Area
10,824		8.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	40	0.0410	0.08		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	71	0.1120	1.67		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
4.5	265	0.0380	0.97		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
0.3	240	0.0250	11.44	686.23	Channel Flow, C - D Area= 60.0 sf Perim= 34.0' r= 1.76' n= 0.030 Earth, grassed & winding
13.5	616	Total			

Summary for Subcatchment S7: SUB 3

Runoff = 22.41 cfs @ 12.14 hrs, Volume= 83,543 cf, Depth= 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

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Type III 24-hr 50-Yr Rainfall=7.30"

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Area (sf)	CN	Description
72,236	98	Paved parking & roofs
66,092	84	50-75% Grass cover, Fair, HSG D
5,176	73	Woods, Fair, HSG C
23,549	79	Woods, Fair, HSG D
167,053	89	Weighted Average
94,817		56.76% Pervious Area
72,236		43.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	58	0.0430	0.20		Sheet Flow, A - B Grass: Short n= 0.150 P2= 3.00"
1.1	136	0.0840	2.03		Shallow Concentrated Flow, B - C Short Grass Pasture Kv= 7.0 fps
2.8	424	0.0150	2.49		Shallow Concentrated Flow, C - D Paved Kv= 20.3 fps
0.1	39	0.0450	9.55	3.33	Pipe Channel, D - E 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
0.3	185	0.0380	11.66	116.60	Channel Flow, E - F Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.5	137	0.0168	4.82	0.95	Pipe Channel, F - G 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
0.4	102	0.0042	4.67	14.66	Pipe Channel, G - H 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
10.0	1,081	Total			

Summary for Subcatchment S8: SUB 8

Runoff = 6.87 cfs @ 12.29 hrs, Volume= 32,384 cf, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
4,122	98	Paved parking & roofs
439	79	50-75% Grass cover, Fair, HSG C
34,658	74	>75% Grass cover, Good, HSG C
4,166	73	Woods, Fair, HSG C
38,464	79	Woods, Fair, HSG D
81,849	78	Weighted Average
77,727		94.96% Pervious Area
4,122		5.04% Impervious Area

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Type III 24-hr 50-Yr Rainfall=7.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	120	0.0500	0.11		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
1.4	138	0.1100	1.66		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
1.9	141	0.0320	1.25		Shallow Concentrated Flow, C - D Short Grass Pasture Kv= 7.0 fps
21.1	399	Total			

Summary for Reach R1: REACH 1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 3.87" for 50-Yr event
 Inflow = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf
 Outflow = 15.78 cfs @ 13.57 hrs, Volume= 473,244 cf, Atten= 0%, Lag= 7.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.63 fps, Min. Travel Time= 3.9 min
 Avg. Velocity= 0.64 fps, Avg. Travel Time= 10.1 min

Peak Storage= 3,732 cf @ 13.50 hrs
 Average Depth at Peak Storage= 0.28'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 256.49 cfs

100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
 Length= 386.0' Slope= 0.0104 '/'
 Inlet Invert= 30.00', Outlet Invert= 26.00'

**Summary for Reach R2: REACH 2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 4.64" for 50-Yr event
 Inflow = 45.49 cfs @ 13.02 hrs, Volume= 352,800 cf
 Outflow = 35.27 cfs @ 13.20 hrs, Volume= 352,800 cf, Atten= 22%, Lag= 10.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 2.07 fps, Min. Travel Time= 4.2 min
 Avg. Velocity= 0.66 fps, Avg. Travel Time= 13.3 min

Peak Storage= 8,993 cf @ 13.13 hrs
 Average Depth at Peak Storage= 0.40'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 252.44 cfs

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Type III 24-hr 50-Yr Rainfall=7.30"

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100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 527.0' Slope= 0.0100 '/'
Inlet Invert= 31.29', Outlet Invert= 26.00'



Summary for Reach R3: REACH 3

Inflow Area = 2,380,909 sf, 3.30% Impervious, Inflow Depth = 4.16" for 50-Yr event
Inflow = 50.95 cfs @ 13.20 hrs, Volume= 826,044 cf
Outflow = 50.29 cfs @ 13.29 hrs, Volume= 826,043 cf, Atten= 1%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.26 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 9.2 min

Peak Storage= 8,357 cf @ 13.24 hrs
Average Depth at Peak Storage= 1.15'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 141.56 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 874.0' Slope= 0.0138 '/'
Inlet Invert= 26.00', Outlet Invert= 13.90'



Summary for Reach R3.1: REACH 3.1

Inflow Area = 51,845 sf, 73.70% Impervious, Inflow Depth = 6.43" for 50-Yr event
Inflow = 6.73 cfs @ 12.12 hrs, Volume= 27,763 cf
Outflow = 4.81 cfs @ 12.22 hrs, Volume= 27,763 cf, Atten= 29%, Lag= 6.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.94 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 0.36 fps, Avg. Travel Time= 8.4 min

Peak Storage= 912 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 833.80 cfs

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Type III 24-hr 50-Yr Rainfall=7.30"

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50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 179.0' Slope= 0.0056 '/'
Inlet Invert= 24.90', Outlet Invert= 23.90'



Summary for Reach R3.2: REACH 3.2

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 5.03" for 50-Yr event
Inflow = 1.44 cfs @ 12.07 hrs, Volume= 4,357 cf
Outflow = 1.40 cfs @ 12.12 hrs, Volume= 4,357 cf, Atten= 3%, Lag= 2.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.91 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 2.3 min

Peak Storage= 141 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 1,651.08 cfs

50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 91.3' Slope= 0.0219 '/'
Inlet Invert= 26.90', Outlet Invert= 24.90'



Summary for Reach R4: REACH 4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 4.76" for 50-Yr event
Inflow = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf
Outflow = 61.80 cfs @ 12.52 hrs, Volume= 451,402 cf, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.02 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1,478 cf @ 12.51 hrs
Average Depth at Peak Storage= 1.22'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 157.25 cfs

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Type III 24-hr 50-Yr Rainfall=7.30"

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6.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 14.00'

Length= 144.0' Slope= 0.0171 ' '

Inlet Invert= 16.36', Outlet Invert= 13.90'



Summary for Reach R4.1: REACH 4.1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 6.94" for 50-Yr event
Inflow = 5.53 cfs @ 12.11 hrs, Volume= 21,238 cf
Outflow = 4.29 cfs @ 12.26 hrs, Volume= 21,238 cf, Atten= 23%, Lag= 8.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 1.77 fps, Min. Travel Time= 5.2 min

Avg. Velocity = 0.55 fps, Avg. Travel Time= 16.7 min

Peak Storage= 1,335 cf @ 12.17 hrs

Average Depth at Peak Storage= 0.18'

Bank-Full Depth= 2.00' Flow Area= 56.0 sf, Capacity= 390.71 cfs

12.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 8.0 ' ' Top Width= 44.00'

Length= 552.0' Slope= 0.0145 ' '

Inlet Invert= 22.00', Outlet Invert= 14.00'



Summary for Reach R5: REACH 5

Inflow Area = 4,566,614 sf, 15.42% Impervious, Inflow Depth = 4.51" for 50-Yr event
Inflow = 148.19 cfs @ 12.60 hrs, Volume= 1,718,045 cf
Outflow = 148.18 cfs @ 12.62 hrs, Volume= 1,718,045 cf, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 8.19 fps, Min. Travel Time= 0.6 min

Avg. Velocity = 2.08 fps, Avg. Travel Time= 2.5 min

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Peak Storage= 5,738 cf @ 12.61 hrs

Average Depth at Peak Storage= 2.01'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 147.04 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 13.00'

Length= 317.0' Slope= 0.0134 ' '

Inlet Invert= 13.90', Outlet Invert= 9.64'



Summary for Reach R6: REACH 6

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 4.55" for 50-Yr event

Inflow = 55.52 cfs @ 12.55 hrs, Volume= 367,756 cf

Outflow = 55.51 cfs @ 12.56 hrs, Volume= 367,756 cf, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 6.37 fps, Min. Travel Time= 0.3 min

Avg. Velocity = 1.78 fps, Avg. Travel Time= 1.2 min

Peak Storage= 1,160 cf @ 12.55 hrs

Average Depth at Peak Storage= 0.49'

Bank-Full Depth= 2.00' Flow Area= 42.0 sf, Capacity= 623.19 cfs

17.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 2.0 ' ' Top Width= 25.00'

Length= 133.0' Slope= 0.0328 ' '

Inlet Invert= 23.90', Outlet Invert= 19.54'



Summary for Pond AP3: 4 - 24"CMP

Inflow Area = 4,699,294 sf, 15.21% Impervious, Inflow Depth = 4.53" for 50-Yr event

Inflow = 152.41 cfs @ 12.60 hrs, Volume= 1,774,265 cf

Outflow = 155.89 cfs @ 12.76 hrs, Volume= 1,784,380 cf, Atten= 0%, Lag= 9.6 min

Primary = 116.94 cfs @ 12.76 hrs, Volume= 1,760,487 cf

Secondary = 38.95 cfs @ 12.76 hrs, Volume= 23,892 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 6

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Peak Elev= 17.32' @ 12.76 hrs Surf.Area= 44,026 sf Storage= 96,037 cf

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

Center-of-Mass det. time= 4.9 min (906.7 - 901.8)

Volume	Invert	Avail.Storage	Storage Description
#1	9.64'	96,037 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.64	0	0	0
10.00	856	154	154
12.00	4,037	4,893	5,047
14.00	13,588	17,625	22,672
16.00	39,016	52,604	75,276
16.50	44,026	20,761	96,037

Device	Routing	Invert	Outlet Devices
#1	Primary	9.77'	24.0" Round Proposed 3 - 24" CMP X 3.00 L= 65.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.12' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Primary	9.83'	24.0" Round Existing 24" CMP L= 64.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.83' S= -0.0009 ' S= -0.0009 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#3	Secondary	16.50'	20.0' long x 25.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=116.94 cfs @ 12.76 hrs HW=17.32' (Free Discharge)↑ **1=Proposed 3 - 24" CMP** (Barrel Controls 88.79 cfs @ 9.42 fps)↑ **2=Existing 24" CMP** (Barrel Controls 28.15 cfs @ 8.96 fps)**Secondary OutFlow** Max=38.92 cfs @ 12.76 hrs HW=17.32' (Free Discharge)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 38.92 cfs @ 2.38 fps)**Summary for Pond C3: CULV-3**

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 3.87" for 50-Yr event
 Inflow = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf
 Outflow = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf, Atten= 0%, Lag= 0.0 min
 Primary = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.51' @ 13.45 hrs

Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.60'	24.0" Round Culvert L= 169.0' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 31.60' / 30.00' S= 0.0095 ' / ' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 3.14 sf

Primary OutFlow Max=15.78 cfs @ 13.45 hrs HW=33.51' TW=31.60' (Fixed TW Elev= 31.60')

↑**1=Culvert** (Outlet Controls 15.78 cfs @ 6.55 fps)

Summary for Pond C4: CULV-4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 4.76" for 50-Yr event
 Inflow = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf
 Outflow = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf, Atten= 0%, Lag= 0.0 min
 Primary = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 30.18' @ 12.51 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.79'	24.0" Round Culvert L= 86.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 16.79' / 16.36' S= 0.0050 ' / ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=61.80 cfs @ 12.51 hrs HW=30.18' (Free Discharge)

↑**1=Culvert** (Barrel Controls 61.80 cfs @ 19.67 fps)

Summary for Pond C7: CULV-7

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 4.55" for 50-Yr event
 Inflow = 55.51 cfs @ 12.56 hrs, Volume= 367,756 cf
 Outflow = 55.63 cfs @ 12.56 hrs, Volume= 367,860 cf, Atten= 0%, Lag= 0.0 min
 Primary = 33.07 cfs @ 12.56 hrs, Volume= 335,031 cf
 Secondary = 22.56 cfs @ 12.56 hrs, Volume= 32,828 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 23.51' @ 12.56 hrs Surf.Area= 7,106 sf Storage= 9,728 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 1.7 min (852.5 - 850.8)

Volume	Invert	Avail.Storage	Storage Description
#1	19.54'	9,728 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.54	0	0	0
20.00	144	33	33
21.00	890	517	550
22.00	2,015	1,453	2,003
23.00	6,588	4,302	6,304
23.50	7,106	3,424	9,728

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Device	Routing	Invert	Outlet Devices
#1	Primary	19.54'	24.0" Round 24" RCP L= 184.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 19.54' / 16.79' S= 0.0149 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	23.40'	250.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=33.07 cfs @ 12.56 hrs HW=23.51' (Free Discharge)↑**1=24" RCP** (Barrel Controls 33.07 cfs @ 10.53 fps)**Secondary OutFlow** Max=22.38 cfs @ 12.56 hrs HW=23.51' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 22.38 cfs @ 0.83 fps)**Summary for Pond CB5: CB-5**

Inflow Area = 1,672 sf, 27.51% Impervious, Inflow Depth = 4.75" for 50-Yr event
 Inflow = 0.22 cfs @ 12.07 hrs, Volume= 662 cf
 Outflow = 0.22 cfs @ 12.07 hrs, Volume= 662 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.22 cfs @ 12.07 hrs, Volume= 662 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 979.45' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	29.50'	1.0" Round 12" CULV L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.50' / 29.15' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.01 sf

Primary OutFlow Max=0.22 cfs @ 12.07 hrs HW=975.65' (Free Discharge)↑**1=12" CULV** (Barrel Controls 0.22 cfs @ 40.26 fps)**Summary for Pond CB6: CB-6**

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 5.03" for 50-Yr event
 Inflow = 1.44 cfs @ 12.07 hrs, Volume= 4,357 cf
 Outflow = 1.44 cfs @ 12.07 hrs, Volume= 4,357 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.44 cfs @ 12.07 hrs, Volume= 4,357 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 28.55' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.82'	12.0" Round 12"SD L= 184.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 27.82' / 26.90' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 0.79 sf

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Primary OutFlow Max=1.44 cfs @ 12.07 hrs HW=28.55' (Free Discharge)

↑1=12"SD (Barrel Controls 1.44 cfs @ 3.28 fps)

Summary for Pond DMH-1: DMH-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 6.94" for 50-Yr event
 Inflow = 6.23 cfs @ 12.07 hrs, Volume= 21,238 cf
 Outflow = 6.23 cfs @ 12.07 hrs, Volume= 21,238 cf, Atten= 0%, Lag= 0.0 min
 Primary = 6.23 cfs @ 12.07 hrs, Volume= 21,238 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.80' @ 12.07 hrs

Flood Elev= 36.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.58'	24.0" Round 24" SD to Detention Bed L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 32.58' / 32.35' S= 0.0077 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=6.23 cfs @ 12.07 hrs HW=33.80' (Free Discharge)

↑1=24" SD to Detention Bed (Barrel Controls 6.23 cfs @ 4.45 fps)

Summary for Pond DMH-6: DMH-6

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 6.82" for 50-Yr event
 Inflow = 7.00 cfs @ 12.07 hrs, Volume= 23,567 cf
 Outflow = 7.00 cfs @ 12.07 hrs, Volume= 23,567 cf, Atten= 0%, Lag= 0.0 min
 Primary = 7.00 cfs @ 12.07 hrs, Volume= 23,567 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 31.30' @ 12.07 hrs

Flood Elev= 32.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	30.13'	24.0" Round 24" SD to Detention Bed L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 30.13' / 28.90' S= 0.2050 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.00 cfs @ 12.07 hrs HW=31.30' (Free Discharge)

↑1=24" SD to Detention Bed (Inlet Controls 7.00 cfs @ 3.68 fps)

Summary for Pond OC1: OFFSITE CULV-1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 3.87" for 50-Yr event
 Inflow = 87.48 cfs @ 12.41 hrs, Volume= 473,256 cf
 Outflow = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf, Atten= 82%, Lag= 62.6 min
 Primary = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf

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Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 37.48' @ 13.45 hrs Surf.Area= 119,215 sf Storage= 202,628 cf

Plug-Flow detention time= 144.2 min calculated for 473,246 cf (100% of inflow)
 Center-of-Mass det. time= 144.1 min (994.5 - 850.3)

Volume	Invert	Avail.Storage	Storage Description
#1	34.25'	602,689 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.25	5,289	0	0
36.00	67,698	63,864	63,864
38.00	137,090	204,788	268,652
40.00	196,947	334,037	602,689

Device	Routing	Invert	Outlet Devices
#1	Primary	34.25'	18.0" Round 18" RCP L= 97.6' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 34.25' / 32.29' S= 0.0201 ' S= 0.0201 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=15.78 cfs @ 13.45 hrs HW=37.48' (Free Discharge)

↑ **1=18" RCP** (Barrel Controls 15.78 cfs @ 8.93 fps)

Summary for Pond OC2: OFFSITE CULV-2

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 4.64" for 50-Yr event
 Inflow = 45.22 cfs @ 12.80 hrs, Volume= 352,800 cf
 Outflow = 45.49 cfs @ 13.02 hrs, Volume= 352,800 cf, Atten= 0%, Lag= 13.4 min
 Primary = 45.49 cfs @ 13.02 hrs, Volume= 352,800 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 62.75' @ 13.02 hrs Surf.Area= 30,513 sf Storage= 71,548 cf

Plug-Flow detention time= 38.2 min calculated for 352,800 cf (100% of inflow)
 Center-of-Mass det. time= 38.1 min (900.4 - 862.3)

Volume	Invert	Avail.Storage	Storage Description
#1	32.88'	71,548 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.88	5,285	0	0
34.00	8,520	7,731	7,731
36.00	12,392	20,912	28,643
38.00	30,513	42,905	71,548

Device	Routing	Invert	Outlet Devices
#1	Primary	32.88'	18.0" Round 18" RCP L= 93.6' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 32.88' / 31.29' S= 0.0170 ' / ' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=45.49 cfs @ 13.02 hrs HW=62.75' (Free Discharge)↑ **1=18" RCP** (Barrel Controls 45.49 cfs @ 25.74 fps)**Summary for Pond P3.1: STORMTECH DETENTION / OCS-2**

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 6.82" for 50-Yr event
 Inflow = 7.00 cfs @ 12.07 hrs, Volume= 23,567 cf
 Outflow = 5.33 cfs @ 12.12 hrs, Volume= 23,406 cf, Atten= 24%, Lag= 3.2 min
 Primary = 5.33 cfs @ 12.12 hrs, Volume= 23,406 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 31.27' @ 12.12 hrs Surf.Area= 3,328 sf Storage= 7,258 cf
 Flood Elev= 31.21' Surf.Area= 3,328 sf Storage= 7,258 cf

Plug-Flow detention time= 126.3 min calculated for 23,401 cf (99% of inflow)
 Center-of-Mass det. time= 121.7 min (874.9 - 753.2)

Volume	Invert	Avail.Storage	Storage Description
#1	27.67'	2,926 cf	34.70'W x 95.90'L x 3.50'H Prismatic 11,647 cf Overall - 4,331 cf Embedded = 7,316 cf x 40.0% Voids
#2	28.17'	4,331 cf	ADS_StormTech SC-740 @ 95.90' L x 7 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 95.90'L = 618.8 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		7,258 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	25.15'	24.0" Round 24" SD L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 25.15' / 25.00' S= 0.0100 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	25.15'	2.0" Vert. 2" Orifice C= 0.600
#3	Device 1	29.12'	4.0" Vert. 4" Orifice C= 0.600
#4	Device 1	30.90'	6.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=5.08 cfs @ 12.12 hrs HW=31.26' (Free Discharge)↑ **1=24" SD** (Passes 5.08 cfs of 26.99 cfs potential flow)↑ **2=2" Orifice** (Orifice Controls 0.26 cfs @ 11.82 fps)↑ **3=4" Orifice** (Orifice Controls 0.59 cfs @ 6.76 fps)↑ **4=Sharp-Crested Vee/Trap Weir** (Weir Controls 4.23 cfs @ 1.96 fps)**Summary for Pond P4.1: STORMTECH DETENTION / OCS-1**

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 6.94" for 50-Yr event
 Inflow = 6.23 cfs @ 12.07 hrs, Volume= 21,238 cf
 Outflow = 5.53 cfs @ 12.11 hrs, Volume= 21,238 cf, Atten= 11%, Lag= 2.4 min
 Primary = 5.53 cfs @ 12.11 hrs, Volume= 21,238 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

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Peak Elev= 34.08' @ 12.11 hrs Surf.Area= 1,702 sf Storage= 2,775 cf

Flood Elev= 34.78' Surf.Area= 1,702 sf Storage= 3,388 cf

Plug-Flow detention time= 8.9 min calculated for 21,234 cf (100% of inflow)

Center-of-Mass det. time= 8.9 min (756.6 - 747.7)

Volume	Invert	Avail.Storage	Storage Description
#1	31.72'	1,513 cf	25.25'W x 67.40'L x 3.50'H Prismatic 5,956 cf Overall - 2,174 cf Embedded = 3,782 cf x 40.0% Voids
#2	32.22'	2,174 cf	ADS_StormTech SC-740 @ 67.40' L x 5 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 67.40'L = 434.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		3,687 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	28.76'	24.0" Round 24" SD L= 268.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 28.76' / 22.00' S= 0.0252 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	28.76'	4.0" Vert. 4" Orifice C= 0.600
#3	Device 1	32.90'	6.0" Vert. 6" Orifice C= 0.600
#4	Device 1	33.65'	4.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=5.53 cfs @ 12.11 hrs HW=34.08' (Free Discharge)

1=24" SD (Passes 5.53 cfs of 24.81 cfs potential flow)

2=4" Orifice (Orifice Controls 0.95 cfs @ 10.93 fps)

3=6" Orifice (Orifice Controls 0.91 cfs @ 4.64 fps)

4=Sharp-Crested Vee/Trap Weir (Weir Controls 3.67 cfs @ 2.14 fps)

Summary for Pond W: WETLAND

Inflow Area = 917,965 sf, 33.62% Impervious, Inflow Depth = 4.44" for 50-Yr event

Inflow = 54.03 cfs @ 12.50 hrs, Volume= 339,993 cf

Outflow = 53.36 cfs @ 12.56 hrs, Volume= 339,993 cf, Atten= 1%, Lag= 3.6 min

Primary = 53.36 cfs @ 12.56 hrs, Volume= 339,993 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8

Peak Elev= 24.81' @ 12.56 hrs Surf.Area= 17,181 sf Storage= 7,143 cf

Plug-Flow detention time= 1.3 min calculated for 339,922 cf (100% of inflow)

Center-of-Mass det. time= 1.3 min (847.7 - 846.5)

Volume	Invert	Avail.Storage	Storage Description
#1	23.90'	42,267 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.90	0	0	0
24.00	412	21	21
26.00	41,834	42,246	42,267

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Type III 24-hr 50-Yr Rainfall=7.30"

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Device	Routing	Invert	Outlet Devices
#1	Primary	23.90'	152.0 deg x 17.0' long Sharp-Crested Vee/Trap Weir Cv= 2.47 (C= 3.09)

Primary OutFlow Max=53.35 cfs @ 12.56 hrs HW=24.81' (Free Discharge)

↑**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 53.35 cfs @ 2.84 fps)

Summary for Link AP1: AP 1

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 4.76" for 50-Yr event
Inflow = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf
Primary = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf, Atten= 0%, Lag= 0.0 min

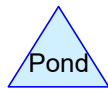
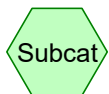
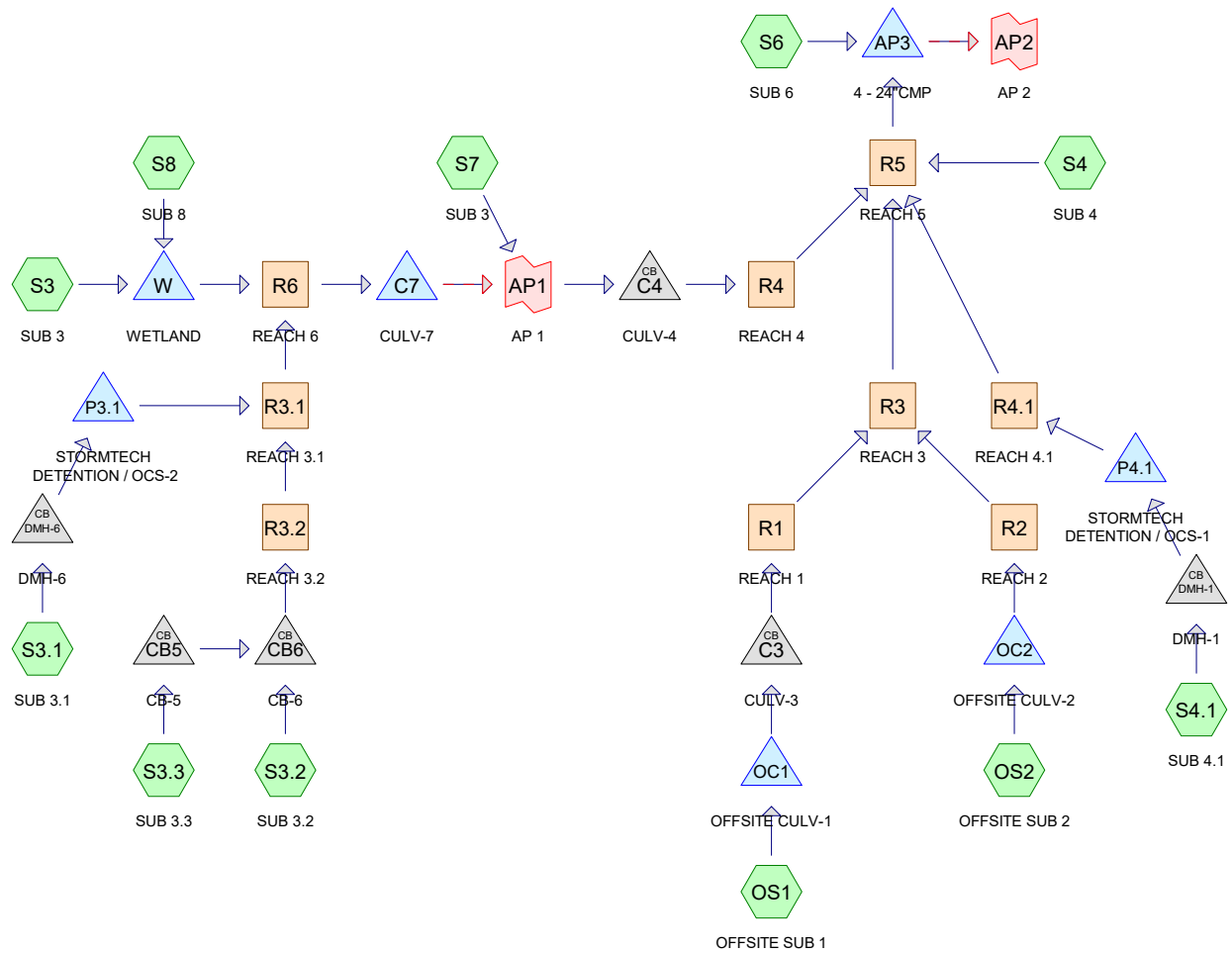
Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP2: AP 2

Inflow Area = 4,699,294 sf, 15.21% Impervious, Inflow Depth = 4.56" for 50-Yr event
Inflow = 155.89 cfs @ 12.76 hrs, Volume= 1,784,380 cf
Primary = 155.89 cfs @ 12.76 hrs, Volume= 1,784,380 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Appendix B:
Post Development Campus Drainage HydroCAD Caluclations



Routing Diagram for Campus - Post Development
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Campus - Post Development

Type III 24-hr 2-Yr Rainfall=3.30"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment OS1: OFFSITE SUB 1 Runoff Area=1,467,784 sf 3.67% Impervious Runoff Depth=0.89"
Flow Length=1,645' Tc=29.1 min CN=70 Runoff=18.18 cfs 108,481 cf

Subcatchment OS2: OFFSITE SUB 2 Runoff Area=913,125 sf 2.70% Impervious Runoff Depth=1.28"
Flow Length=1,654' Tc=58.8 min CN=77 Runoff=12.15 cfs 97,685 cf

Subcatchment S3: SUB 3 Runoff Area=836,116 sf 36.42% Impervious Runoff Depth=1.16"
Flow Length=828' Tc=39.2 min CN=75 Runoff=12.49 cfs 80,978 cf

Subcatchment S3.1: SUB 3.1 Runoff Area=41,451 sf 89.14% Impervious Runoff Depth=2.85"
Flow Length=160' Slope=0.0100 ' ' Tc=5.0 min CN=96 Runoff=3.06 cfs 9,837 cf

Subcatchment S3.2: SUB 3.2 Runoff Area=8,722 sf 9.15% Impervious Runoff Depth=1.55"
Flow Length=163' Slope=0.0220 ' ' Tc=5.0 min CN=81 Runoff=0.37 cfs 1,125 cf

Subcatchment S3.3: SUB 3.3 Runoff Area=1,672 sf 27.51% Impervious Runoff Depth=1.35"
Tc=5.0 min CN=78 Runoff=0.06 cfs 188 cf

Subcatchment S4: SUB 4 Runoff Area=1,011,187 sf 18.65% Impervious Runoff Depth=1.48"
Flow Length=1,599' Tc=46.2 min CN=80 Runoff=18.16 cfs 124,649 cf

Subcatchment S4.1: SUB 4.1 Runoff Area=36,714 sf 95.49% Impervious Runoff Depth=2.96"
Flow Length=281' Slope=0.0100 ' ' Tc=5.0 min CN=97 Runoff=2.76 cfs 9,043 cf

Subcatchment S6: SUB 6 Runoff Area=132,680 sf 8.16% Impervious Runoff Depth=1.55"
Flow Length=616' Tc=13.5 min CN=81 Runoff=4.32 cfs 17,117 cf

Subcatchment S7: SUB 3 Runoff Area=167,053 sf 43.24% Impervious Runoff Depth=2.17"
Flow Length=1,081' Tc=10.0 min CN=89 Runoff=8.48 cfs 30,251 cf

Subcatchment S8: SUB 8 Runoff Area=81,849 sf 5.04% Impervious Runoff Depth=1.35"
Flow Length=399' Tc=21.1 min CN=78 Runoff=1.92 cfs 9,188 cf

Reach R1: REACH 1 Avg. Flow Depth=0.19' Max Vel=1.26 fps Inflow=6.83 cfs 108,474 cf
n=0.030 L=386.0' S=0.0104 ' ' Capacity=256.49 cfs Outflow=6.82 cfs 108,472 cf

Reach R2: REACH 2 Avg. Flow Depth=0.23' Max Vel=1.40 fps Inflow=10.07 cfs 97,680 cf
n=0.030 L=527.0' S=0.0100 ' ' Capacity=252.44 cfs Outflow=10.00 cfs 97,679 cf

Reach R3: REACH 3 Avg. Flow Depth=0.62' Max Vel=3.73 fps Inflow=16.80 cfs 206,151 cf
n=0.030 L=874.0' S=0.0138 ' ' Capacity=141.56 cfs Outflow=16.76 cfs 206,149 cf

Reach R3.1: REACH 3.1 Avg. Flow Depth=0.03' Max Vel=0.41 fps Inflow=0.60 cfs 11,150 cf
n=0.025 L=179.0' S=0.0056 ' ' Capacity=833.80 cfs Outflow=0.53 cfs 11,150 cf

Reach R3.2: REACH 3.2 Avg. Flow Depth=0.01' Max Vel=0.65 fps Inflow=0.44 cfs 1,313 cf
n=0.025 L=91.3' S=0.0219 ' ' Capacity=1,651.08 cfs Outflow=0.40 cfs 1,313 cf

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Reach R4: REACH 4 Avg. Flow Depth=0.57' Max Vel=3.95 fps Inflow=16.14 cfs 131,567 cf
n=0.030 L=144.0' S=0.0171 '/' Capacity=157.25 cfs Outflow=16.14 cfs 131,567 cf

Reach R4.1: REACH 4.1 Avg. Flow Depth=0.07' Max Vel=0.99 fps Inflow=0.89 cfs 9,043 cf
n=0.030 L=552.0' S=0.0145 '/' Capacity=390.71 cfs Outflow=0.87 cfs 9,043 cf

Reach R5: REACH 5 Avg. Flow Depth=1.01' Max Vel=5.67 fps Inflow=40.33 cfs 471,407 cf
n=0.025 L=317.0' S=0.0134 '/' Capacity=147.04 cfs Outflow=40.31 cfs 471,407 cf

Reach R6: REACH 6 Avg. Flow Depth=0.21' Max Vel=3.78 fps Inflow=14.12 cfs 101,316 cf
n=0.025 L=133.0' S=0.0328 '/' Capacity=623.19 cfs Outflow=14.12 cfs 101,316 cf

Pond AP3: 4 - 24"CMP Peak Elev=11.78' Storage=4,211 cf Inflow=41.17 cfs 488,523 cf
Primary=41.07 cfs 488,500 cf Secondary=0.00 cfs 0 cf Outflow=41.07 cfs 488,500 cf

Pond C3: CULV-3 Peak Elev=32.83' Inflow=6.83 cfs 108,474 cf
24.0" Round Culvert n=0.013 L=169.0' S=0.0095 '/' Outflow=6.83 cfs 108,474 cf

Pond C4: CULV-4 Peak Elev=18.95' Inflow=16.14 cfs 131,567 cf
24.0" Round Culvert n=0.011 L=86.0' S=0.0050 '/' Outflow=16.14 cfs 131,567 cf

Pond C7: CULV-7 Peak Elev=21.02' Storage=569 cf Inflow=14.12 cfs 101,316 cf
Primary=14.10 cfs 101,316 cf Secondary=0.00 cfs 0 cf Outflow=14.10 cfs 101,316 cf

Pond CB5: CB-5 Peak Elev=104.12' Inflow=0.06 cfs 188 cf
1.0" Round Culvert n=0.010 L=70.0' S=0.0050 '/' Outflow=0.06 cfs 188 cf

Pond CB6: CB-6 Peak Elev=28.20' Inflow=0.44 cfs 1,313 cf
12.0" Round Culvert n=0.013 L=184.0' S=0.0050 '/' Outflow=0.44 cfs 1,313 cf

Pond DMH-1: DMH-1 Peak Elev=33.33' Inflow=2.76 cfs 9,043 cf
24.0" Round Culvert n=0.010 L=30.0' S=0.0077 '/' Outflow=2.76 cfs 9,043 cf

Pond DMH-6: DMH-6 Peak Elev=30.87' Inflow=3.06 cfs 9,837 cf
24.0" Round Culvert n=0.010 L=6.0' S=0.2050 '/' Outflow=3.06 cfs 9,837 cf

Pond OC1: OFFSITE CULV-1 Peak Elev=35.42' Storage=30,746 cf Inflow=18.18 cfs 108,481 cf
18.0" Round Culvert n=0.013 L=97.6' S=0.0201 '/' Outflow=6.83 cfs 108,474 cf

Pond OC2: OFFSITE CULV-2 Peak Elev=34.53' Storage=12,480 cf Inflow=12.15 cfs 97,685 cf
18.0" Round Culvert n=0.013 L=93.6' S=0.0170 '/' Outflow=10.07 cfs 97,680 cf

Pond P3.1: STORMTECH DETENTION / OCS-2 Peak Elev=29.36' Storage=3,885 cf Inflow=3.06 cfs 9,837 cf
Outflow=0.32 cfs 9,837 cf

Pond P4.1: STORMTECH DETENTION / OCS-1 Peak Elev=33.01' Storage=1,451 cf Inflow=2.76 cfs 9,043 cf
Outflow=0.89 cfs 9,043 cf

Pond W: WETLAND Peak Elev=24.29' Storage=1,005 cf Inflow=13.72 cfs 90,166 cf
Outflow=13.67 cfs 90,166 cf

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Link AP1: AP 1

Inflow=16.14 cfs 131,567 cf

Primary=16.14 cfs 131,567 cf

Link AP2: AP 2

Inflow=41.07 cfs 488,500 cf

Primary=41.07 cfs 488,500 cf

Total Runoff Area = 4,698,353 sf Runoff Volume = 488,543 cf Average Runoff Depth = 1.25"
84.42% Pervious = 3,966,350 sf 15.58% Impervious = 732,003 sf

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Type III 24-hr 2-Yr Rainfall=3.30"

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Summary for Subcatchment OS1: OFFSITE SUB 1

Runoff = 18.18 cfs @ 12.45 hrs, Volume= 108,481 cf, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
53,844	98	Paved parking & roofs
32,748	49	50-75% Grass cover, Fair, HSG A
12,803	79	50-75% Grass cover, Fair, HSG C
12,554	84	50-75% Grass cover, Fair, HSG D
205,440	30	Woods, Good, HSG A
228,765	70	Woods, Good, HSG C
921,630	77	Woods, Good, HSG D
1,467,784	70	Weighted Average
1,413,940		96.33% Pervious Area
53,844		3.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0430	0.25		Sheet Flow, A - B
					Range n= 0.130 P2= 3.00"
0.8	75	0.0510	1.58		Shallow Concentrated Flow, B -C
					Short Grass Pasture Kv= 7.0 fps
20.3	923	0.0230	0.76		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
1.4	547	0.0180	6.31	157.83	Channel Flow, D - E
					Area= 25.0 sf Perim= 27.0' r= 0.93'
					n= 0.030 Earth, grassed & winding
29.1	1,645	Total			

Summary for Subcatchment OS2: OFFSITE SUB 2

Runoff = 12.15 cfs @ 12.86 hrs, Volume= 97,685 cf, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
24,623	98	Paved parking & roofs
8,226	79	50-75% Grass cover, Fair, HSG C
13,667	84	50-75% Grass cover, Fair, HSG D
151,095	70	Woods, Good, HSG C
715,514	77	Woods, Good, HSG D
913,125	77	Weighted Average
888,502		97.30% Pervious Area
24,623		2.70% Impervious Area

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Type III 24-hr 2-Yr Rainfall=3.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0530	0.11		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
43.8	1,554	0.0140	0.59		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
58.8	1,654	Total			

Summary for Subcatchment S3: SUB 3

Runoff = 12.49 cfs @ 12.59 hrs, Volume= 80,978 cf, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
304,505	98	Paved parking & roofs
45,477	49	50-75% Grass cover, Fair, HSG A
10,125	79	50-75% Grass cover, Fair, HSG C
78,239	84	50-75% Grass cover, Fair, HSG D
142,893	30	Woods, Good, HSG A
81,209	70	Woods, Good, HSG C
173,668	77	Woods, Good, HSG D
836,116	75	Weighted Average
531,611		63.58% Pervious Area
304,505		36.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.0950	0.15		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.5	143	0.1000	1.58		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
21.3	535	0.0070	0.42		Shallow Concentrated Flow, C -D
					Woodland Kv= 5.0 fps
39.2	828	Total			

Summary for Subcatchment S3.1: SUB 3.1

Runoff = 3.06 cfs @ 12.07 hrs, Volume= 9,837 cf, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

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Type III 24-hr 2-Yr Rainfall=3.30"

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Area (sf)	CN	Description
36,951	98	Paved parking & roofs
3,700	79	50-75% Grass cover, Fair, HSG C
800	84	50-75% Grass cover, Fair, HSG D
41,451	96	Weighted Average
4,500		10.86% Pervious Area
36,951		89.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	160	0.0100	1.11		Sheet Flow, A - B
					Smooth surfaces n= 0.011 P2= 3.00"
2.6					Direct Entry, Min Tc
5.0	160	Total			

Summary for Subcatchment S3.2: SUB 3.2

Runoff = 0.37 cfs @ 12.08 hrs, Volume= 1,125 cf, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
798	98	Paved parking & roofs
7,924	79	50-75% Grass cover, Fair, HSG C
8,722	81	Weighted Average
7,924		90.85% Pervious Area
798		9.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	163	0.0220	1.04		Shallow Concentrated Flow, A - B
					Short Grass Pasture Kv= 7.0 fps
2.4					Direct Entry,
5.0	163	Total			

Summary for Subcatchment S3.3: SUB 3.3

Runoff = 0.06 cfs @ 12.08 hrs, Volume= 188 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
460	98	Paved parking & roofs
1,212	70	Woods, Good, HSG C
1,672	78	Weighted Average
1,212		72.49% Pervious Area
460		27.51% Impervious Area

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Type III 24-hr 2-Yr Rainfall=3.30"

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

Summary for Subcatchment S4: SUB 4

Runoff = 18.16 cfs @ 12.67 hrs, Volume= 124,649 cf, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
188,582	98	Paved parking & roofs
20,781	79	50-75% Grass cover, Fair, HSG C
11,998	84	50-75% Grass cover, Fair, HSG D
419,188	73	Woods, Fair, HSG C
370,638	79	Woods, Fair, HSG D
1,011,187	80	Weighted Average
822,605		81.35% Pervious Area
188,582		18.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.3	100	0.0100	0.06		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.9	284	0.0600	1.22		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
10.4	341	0.0120	0.55		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
2.6	874	0.0140	5.64	281.88	Channel Flow, D - E
					Area= 50.0 sf Perim= 53.0' r= 0.94'
					n= 0.030 Earth, grassed & winding
46.2	1,599	Total			

Summary for Subcatchment S4.1: SUB 4.1

Runoff = 2.76 cfs @ 12.07 hrs, Volume= 9,043 cf, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
35,058	98	Paved parking & roofs
1,656	74	>75% Grass cover, Good, HSG C
36,714	97	Weighted Average
1,656		4.51% Pervious Area
35,058		95.49% Impervious Area

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Type III 24-hr 2-Yr Rainfall=3.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	200	0.0100	1.16		Sheet Flow, A - B Smooth surfaces n= 0.011 P2= 3.00"
0.7	81	0.0100	2.03		Shallow Concentrated Flow, B - C Paved Kv= 20.3 fps
1.4					Direct Entry, Min Tc
5.0	281	Total			

Summary for Subcatchment S6: SUB 6

Runoff = 4.32 cfs @ 12.19 hrs, Volume= 17,117 cf, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
10,824	98	Paved parking & roofs
19,401	79	50-75% Grass cover, Fair, HSG C
64,092	84	50-75% Grass cover, Fair, HSG D
32,603	70	Woods, Good, HSG C
5,760	77	Woods, Good, HSG D
132,680	81	Weighted Average
121,856		91.84% Pervious Area
10,824		8.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	40	0.0410	0.08		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	71	0.1120	1.67		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
4.5	265	0.0380	0.97		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
0.3	240	0.0250	11.44	686.23	Channel Flow, C - D Area= 60.0 sf Perim= 34.0' r= 1.76' n= 0.030 Earth, grassed & winding
13.5	616	Total			

Summary for Subcatchment S7: SUB 3

Runoff = 8.48 cfs @ 12.14 hrs, Volume= 30,251 cf, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

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Type III 24-hr 2-Yr Rainfall=3.30"

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Area (sf)	CN	Description
72,236	98	Paved parking & roofs
66,092	84	50-75% Grass cover, Fair, HSG D
5,176	73	Woods, Fair, HSG C
23,549	79	Woods, Fair, HSG D
167,053	89	Weighted Average
94,817		56.76% Pervious Area
72,236		43.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	58	0.0430	0.20		Sheet Flow, A - B Grass: Short n= 0.150 P2= 3.00"
1.1	136	0.0840	2.03		Shallow Concentrated Flow, B - C Short Grass Pasture Kv= 7.0 fps
2.8	424	0.0150	2.49		Shallow Concentrated Flow, C - D Paved Kv= 20.3 fps
0.1	39	0.0450	9.55	3.33	Pipe Channel, D - E 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
0.3	185	0.0380	11.66	116.60	Channel Flow, E - F Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.5	137	0.0168	4.82	0.95	Pipe Channel, F - G 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
0.4	102	0.0042	4.67	14.66	Pipe Channel, G - H 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
10.0	1,081	Total			

Summary for Subcatchment S8: SUB 8

Runoff = 1.92 cfs @ 12.31 hrs, Volume= 9,188 cf, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Yr Rainfall=3.30"

Area (sf)	CN	Description
4,122	98	Paved parking & roofs
439	79	50-75% Grass cover, Fair, HSG C
34,658	74	>75% Grass cover, Good, HSG C
4,166	73	Woods, Fair, HSG C
38,464	79	Woods, Fair, HSG D
81,849	78	Weighted Average
77,727		94.96% Pervious Area
4,122		5.04% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	120	0.0500	0.11		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
1.4	138	0.1100	1.66		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
1.9	141	0.0320	1.25		Shallow Concentrated Flow, C - D Short Grass Pasture Kv= 7.0 fps
21.1	399	Total			

Summary for Reach R1: REACH 1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 0.89" for 2-Yr event
 Inflow = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf
 Outflow = 6.82 cfs @ 13.21 hrs, Volume= 108,472 cf, Atten= 0%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.26 fps, Min. Travel Time= 5.1 min
 Avg. Velocity = 0.44 fps, Avg. Travel Time= 14.7 min

Peak Storage= 2,088 cf @ 13.13 hrs
 Average Depth at Peak Storage= 0.19'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 256.49 cfs

100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
 Length= 386.0' Slope= 0.0104 '/'
 Inlet Invert= 30.00', Outlet Invert= 26.00'

**Summary for Reach R2: REACH 2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 1.28" for 2-Yr event
 Inflow = 10.07 cfs @ 13.13 hrs, Volume= 97,680 cf
 Outflow = 10.00 cfs @ 13.31 hrs, Volume= 97,679 cf, Atten= 1%, Lag= 10.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.40 fps, Min. Travel Time= 6.3 min
 Avg. Velocity = 0.40 fps, Avg. Travel Time= 21.9 min

Peak Storage= 3,757 cf @ 13.21 hrs
 Average Depth at Peak Storage= 0.23'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 252.44 cfs

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100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 527.0' Slope= 0.0100 '/'
Inlet Invert= 31.29', Outlet Invert= 26.00'



Summary for Reach R3: REACH 3

Inflow Area = 2,380,909 sf, 3.30% Impervious, Inflow Depth = 1.04" for 2-Yr event
Inflow = 16.80 cfs @ 13.29 hrs, Volume= 206,151 cf
Outflow = 16.76 cfs @ 13.40 hrs, Volume= 206,149 cf, Atten= 0%, Lag= 6.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.73 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 1.06 fps, Avg. Travel Time= 13.8 min

Peak Storage= 3,928 cf @ 13.34 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 141.56 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 874.0' Slope= 0.0138 '/'
Inlet Invert= 26.00', Outlet Invert= 13.90'



Summary for Reach R3.1: REACH 3.1

Inflow Area = 51,845 sf, 73.70% Impervious, Inflow Depth = 2.58" for 2-Yr event
Inflow = 0.60 cfs @ 12.15 hrs, Volume= 11,150 cf
Outflow = 0.53 cfs @ 12.34 hrs, Volume= 11,150 cf, Atten= 11%, Lag= 11.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.41 fps, Min. Travel Time= 7.2 min
Avg. Velocity = 0.33 fps, Avg. Travel Time= 9.1 min

Peak Storage= 232 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 833.80 cfs

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50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 179.0' Slope= 0.0056 '/'
Inlet Invert= 24.90', Outlet Invert= 23.90'



Summary for Reach R3.2: REACH 3.2

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 1.52" for 2-Yr event
Inflow = 0.44 cfs @ 12.08 hrs, Volume= 1,313 cf
Outflow = 0.40 cfs @ 12.15 hrs, Volume= 1,313 cf, Atten= 9%, Lag= 4.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.65 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 2.4 min

Peak Storage= 56 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.01'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 1,651.08 cfs

50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 91.3' Slope= 0.0219 '/'
Inlet Invert= 26.90', Outlet Invert= 24.90'



Summary for Reach R4: REACH 4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 1.39" for 2-Yr event
Inflow = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf
Outflow = 16.14 cfs @ 12.55 hrs, Volume= 131,567 cf, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.95 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 1.8 min

Peak Storage= 588 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 157.25 cfs

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6.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 14.00'

Length= 144.0' Slope= 0.0171 ' '

Inlet Invert= 16.36', Outlet Invert= 13.90'



Summary for Reach R4.1: REACH 4.1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 2.96" for 2-Yr event
Inflow = 0.89 cfs @ 12.35 hrs, Volume= 9,043 cf
Outflow = 0.87 cfs @ 12.59 hrs, Volume= 9,043 cf, Atten= 2%, Lag= 14.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.99 fps, Min. Travel Time= 9.3 min

Avg. Velocity = 0.48 fps, Avg. Travel Time= 19.1 min

Peak Storage= 485 cf @ 12.43 hrs

Average Depth at Peak Storage= 0.07'

Bank-Full Depth= 2.00' Flow Area= 56.0 sf, Capacity= 390.71 cfs

12.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding

Side Slope Z-value= 8.0 ' ' Top Width= 44.00'

Length= 552.0' Slope= 0.0145 ' '

Inlet Invert= 22.00', Outlet Invert= 14.00'



Summary for Reach R5: REACH 5

Inflow Area = 4,565,673 sf, 15.80% Impervious, Inflow Depth = 1.24" for 2-Yr event
Inflow = 40.33 cfs @ 12.78 hrs, Volume= 471,407 cf
Outflow = 40.31 cfs @ 12.80 hrs, Volume= 471,407 cf, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 5.67 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 1.42 fps, Avg. Travel Time= 3.7 min

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Peak Storage= 2,254 cf @ 12.78 hrs

Average Depth at Peak Storage= 1.01'

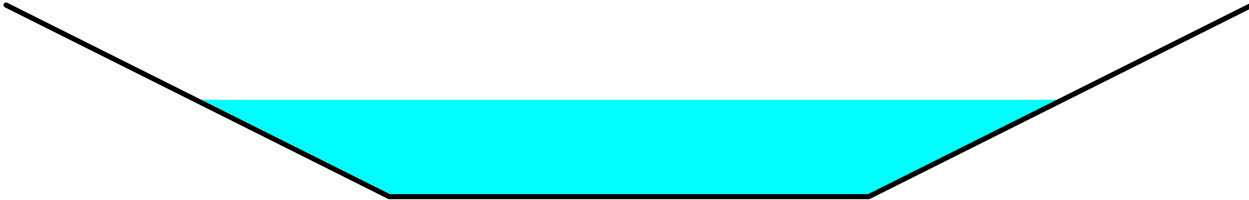
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 147.04 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 13.00'

Length= 317.0' Slope= 0.0134 ' '

Inlet Invert= 13.90', Outlet Invert= 9.64'



Summary for Reach R6: REACH 6

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 1.25" for 2-Yr event

Inflow = 14.12 cfs @ 12.59 hrs, Volume= 101,316 cf

Outflow = 14.12 cfs @ 12.61 hrs, Volume= 101,316 cf, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 3.78 fps, Min. Travel Time= 0.6 min

Avg. Velocity = 1.25 fps, Avg. Travel Time= 1.8 min

Peak Storage= 497 cf @ 12.60 hrs

Average Depth at Peak Storage= 0.21'

Bank-Full Depth= 2.00' Flow Area= 42.0 sf, Capacity= 623.19 cfs

17.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 2.0 ' ' Top Width= 25.00'

Length= 133.0' Slope= 0.0328 ' '

Inlet Invert= 23.90', Outlet Invert= 19.54'



Summary for Pond AP3: 4 - 24"CMP

Inflow Area = 4,698,353 sf, 15.58% Impervious, Inflow Depth = 1.25" for 2-Yr event

Inflow = 41.17 cfs @ 12.79 hrs, Volume= 488,523 cf

Outflow = 41.07 cfs @ 12.82 hrs, Volume= 488,500 cf, Atten= 0%, Lag= 1.8 min

Primary = 41.07 cfs @ 12.82 hrs, Volume= 488,500 cf

Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 6

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Peak Elev= 11.78' @ 12.82 hrs Surf.Area= 3,693 sf Storage= 4,211 cf

Plug-Flow detention time= 2.0 min calculated for 488,500 cf (100% of inflow)

Center-of-Mass det. time= 1.9 min (920.0 - 918.1)

Volume	Invert	Avail.Storage	Storage Description
#1	9.64'	96,037 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.64	0	0	0
10.00	856	154	154
12.00	4,037	4,893	5,047
14.00	13,588	17,625	22,672
16.00	39,016	52,604	75,276
16.50	44,026	20,761	96,037

Device	Routing	Invert	Outlet Devices
#1	Primary	9.77'	24.0" Round Proposed 3 - 24" CMP X 3.00 L= 65.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.12' S= 0.0100 ' / ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Primary	9.83'	24.0" Round Existing 24" CMP L= 64.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.83' S= -0.0009 ' / ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#3	Secondary	16.50'	20.0' long x 25.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=41.08 cfs @ 12.82 hrs HW=11.78' (Free Discharge)↑ **1=Proposed 3 - 24" CMP** (Barrel Controls 33.64 cfs @ 4.41 fps)↑ **2=Existing 24" CMP** (Barrel Controls 7.44 cfs @ 2.92 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=9.64' (Free Discharge)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond C3: CULV-3**

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 0.89" for 2-Yr event
 Inflow = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf
 Outflow = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf, Atten= 0%, Lag= 0.0 min
 Primary = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 32.83' @ 13.06 hrs

Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.60'	24.0" Round Culvert L= 169.0' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 31.60' / 30.00' S= 0.0095 ' /' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 3.14 sf

Primary OutFlow Max=6.83 cfs @ 13.06 hrs HW=32.83' TW=31.60' (Fixed TW Elev= 31.60')

↑**1=Culvert** (Outlet Controls 6.83 cfs @ 4.80 fps)

Summary for Pond C4: CULV-4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 1.39" for 2-Yr event
 Inflow = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf
 Outflow = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf, Atten= 0%, Lag= 0.0 min
 Primary = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 18.95' @ 12.54 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.79'	24.0" Round Culvert L= 86.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 16.79' / 16.36' S= 0.0050 ' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=16.14 cfs @ 12.54 hrs HW=18.95' (Free Discharge)

↑**1=Culvert** (Barrel Controls 16.14 cfs @ 5.91 fps)

Summary for Pond C7: CULV-7

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 1.25" for 2-Yr event
 Inflow = 14.12 cfs @ 12.61 hrs, Volume= 101,316 cf
 Outflow = 14.10 cfs @ 12.62 hrs, Volume= 101,316 cf, Atten= 0%, Lag= 0.9 min
 Primary = 14.10 cfs @ 12.62 hrs, Volume= 101,316 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 21.02' @ 12.62 hrs Surf.Area= 914 sf Storage= 569 cf

Plug-Flow detention time= 0.5 min calculated for 101,316 cf (100% of inflow)
 Center-of-Mass det. time= 0.4 min (891.5 - 891.1)

Volume	Invert	Avail.Storage	Storage Description
#1	19.54'	9,728 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.54	0	0	0
20.00	144	33	33
21.00	890	517	550
22.00	2,015	1,453	2,003
23.00	6,588	4,302	6,304
23.50	7,106	3,424	9,728

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Device	Routing	Invert	Outlet Devices
#1	Primary	19.54'	24.0" Round 24" RCP L= 184.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 19.54' / 16.79' S= 0.0149 ' S= 0.0149 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	23.40'	250.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=14.10 cfs @ 12.62 hrs HW=21.02' (Free Discharge)

↑1=24" RCP (Inlet Controls 14.10 cfs @ 5.65 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.54' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond CB5: CB-5

Inflow Area = 1,672 sf, 27.51% Impervious, Inflow Depth = 1.35" for 2-Yr event
 Inflow = 0.06 cfs @ 12.08 hrs, Volume= 188 cf
 Outflow = 0.06 cfs @ 12.08 hrs, Volume= 188 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.06 cfs @ 12.08 hrs, Volume= 188 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 104.12' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	29.50'	1.0" Round 12" CULV L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.50' / 29.15' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.01 sf

Primary OutFlow Max=0.06 cfs @ 12.08 hrs HW=103.97' (Free Discharge)

↑1=12" CULV (Barrel Controls 0.06 cfs @ 11.31 fps)

Summary for Pond CB6: CB-6

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 1.52" for 2-Yr event
 Inflow = 0.44 cfs @ 12.08 hrs, Volume= 1,313 cf
 Outflow = 0.44 cfs @ 12.08 hrs, Volume= 1,313 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.44 cfs @ 12.08 hrs, Volume= 1,313 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 28.20' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.82'	12.0" Round 12"SD L= 184.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 27.82' / 26.90' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 0.79 sf

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Primary OutFlow Max=0.44 cfs @ 12.08 hrs HW=28.20' (Free Discharge)

↑1=12"SD (Barrel Controls 0.44 cfs @ 2.39 fps)

Summary for Pond DMH-1: DMH-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 2.96" for 2-Yr event
 Inflow = 2.76 cfs @ 12.07 hrs, Volume= 9,043 cf
 Outflow = 2.76 cfs @ 12.07 hrs, Volume= 9,043 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.76 cfs @ 12.07 hrs, Volume= 9,043 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.33' @ 12.07 hrs

Flood Elev= 36.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.58'	24.0" Round 24" SD to Detention Bed L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 32.58' / 32.35' S= 0.0077 ' S= 0.0077 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=2.76 cfs @ 12.07 hrs HW=33.33' (Free Discharge)

↑1=24" SD to Detention Bed (Barrel Controls 2.76 cfs @ 3.77 fps)

Summary for Pond DMH-6: DMH-6

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 2.85" for 2-Yr event
 Inflow = 3.06 cfs @ 12.07 hrs, Volume= 9,837 cf
 Outflow = 3.06 cfs @ 12.07 hrs, Volume= 9,837 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.06 cfs @ 12.07 hrs, Volume= 9,837 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 30.87' @ 12.07 hrs

Flood Elev= 32.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	30.13'	24.0" Round 24" SD to Detention Bed L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 30.13' / 28.90' S= 0.2050 ' S= 0.2050 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.06 cfs @ 12.07 hrs HW=30.86' (Free Discharge)

↑1=24" SD to Detention Bed (Inlet Controls 3.06 cfs @ 2.92 fps)

Summary for Pond OC1: OFFSITE CULV-1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 0.89" for 2-Yr event
 Inflow = 18.18 cfs @ 12.45 hrs, Volume= 108,481 cf
 Outflow = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf, Atten= 62%, Lag= 36.5 min
 Primary = 6.83 cfs @ 13.06 hrs, Volume= 108,474 cf

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Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 35.42' @ 13.06 hrs Surf.Area= 47,126 sf Storage= 30,746 cf

Plug-Flow detention time= 76.7 min calculated for 108,451 cf (100% of inflow)

Center-of-Mass det. time= 76.9 min (971.8 - 894.9)

Volume	Invert	Avail.Storage	Storage Description
#1	34.25'	602,689 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.25	5,289	0	0
36.00	67,698	63,864	63,864
38.00	137,090	204,788	268,652
40.00	196,947	334,037	602,689

Device	Routing	Invert	Outlet Devices
#1	Primary	34.25'	18.0" Round 18" RCP L= 97.6' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 34.25' / 32.29' S= 0.0201 ' S= 0.0201 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=6.84 cfs @ 13.06 hrs HW=35.42' (Free Discharge)↑**1=18" RCP** (Inlet Controls 6.84 cfs @ 4.61 fps)**Summary for Pond OC2: OFFSITE CULV-2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 1.28" for 2-Yr event
 Inflow = 12.15 cfs @ 12.86 hrs, Volume= 97,685 cf
 Outflow = 10.07 cfs @ 13.13 hrs, Volume= 97,680 cf, Atten= 17%, Lag= 16.1 min
 Primary = 10.07 cfs @ 13.13 hrs, Volume= 97,680 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 34.53' @ 13.13 hrs Surf.Area= 9,538 sf Storage= 12,480 cf

Plug-Flow detention time= 29.4 min calculated for 97,680 cf (100% of inflow)

Center-of-Mass det. time= 29.4 min (929.0 - 899.6)

Volume	Invert	Avail.Storage	Storage Description
#1	32.88'	71,548 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.88	5,285	0	0
34.00	8,520	7,731	7,731
36.00	12,392	20,912	28,643
38.00	30,513	42,905	71,548

Device	Routing	Invert	Outlet Devices
#1	Primary	32.88'	18.0" Round 18" RCP L= 93.6' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 32.88' / 31.29' S= 0.0170 ' / ' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=10.07 cfs @ 13.13 hrs HW=34.53' (Free Discharge)

↑1=18" RCP (Inlet Controls 10.07 cfs @ 5.70 fps)

Summary for Pond P3.1: STORMTECH DETENTION / OCS-2

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 2.85" for 2-Yr event
 Inflow = 3.06 cfs @ 12.07 hrs, Volume= 9,837 cf
 Outflow = 0.32 cfs @ 12.73 hrs, Volume= 9,837 cf, Atten= 89%, Lag= 39.8 min
 Primary = 0.32 cfs @ 12.73 hrs, Volume= 9,837 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 29.36' @ 12.73 hrs Surf.Area= 3,328 sf Storage= 3,885 cf
 Flood Elev= 31.21' Surf.Area= 3,328 sf Storage= 7,258 cf

Plug-Flow detention time= 139.0 min calculated for 9,835 cf (100% of inflow)
 Center-of-Mass det. time= 138.9 min (911.2 - 772.2)

Volume	Invert	Avail.Storage	Storage Description
#1	27.67'	2,926 cf	34.70'W x 95.90'L x 3.50'H Prismatoid 11,647 cf Overall - 4,331 cf Embedded = 7,316 cf x 40.0% Voids
#2	28.17'	4,331 cf	ADS_StormTech SC-740 @ 95.90' L x 7' Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 95.90'L = 618.8 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		7,258 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	25.15'	24.0" Round 24" SD L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 25.15' / 25.00' S= 0.0100 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	25.15'	2.0" Vert. 2" Orifice C= 0.600
#3	Device 1	29.12'	4.0" Vert. 4" Orifice C= 0.600
#4	Device 1	30.90'	6.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.32 cfs @ 12.73 hrs HW=29.36' (Free Discharge)

↑1=24" SD (Passes 0.32 cfs of 21.39 cfs potential flow)
 ↑2=2" Orifice (Orifice Controls 0.21 cfs @ 9.78 fps)
 ↑3=4" Orifice (Orifice Controls 0.11 cfs @ 1.66 fps)
 ↑4=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Summary for Pond P4.1: STORMTECH DETENTION / OCS-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 2.96" for 2-Yr event
 Inflow = 2.76 cfs @ 12.07 hrs, Volume= 9,043 cf
 Outflow = 0.89 cfs @ 12.35 hrs, Volume= 9,043 cf, Atten= 68%, Lag= 16.6 min
 Primary = 0.89 cfs @ 12.35 hrs, Volume= 9,043 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

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Peak Elev= 33.01' @ 12.35 hrs Surf.Area= 1,702 sf Storage= 1,451 cf
 Flood Elev= 34.78' Surf.Area= 1,702 sf Storage= 3,388 cf

Plug-Flow detention time= 8.0 min calculated for 9,043 cf (100% of inflow)
 Center-of-Mass det. time= 7.9 min (772.3 - 764.3)

Volume	Invert	Avail.Storage	Storage Description
#1	31.72'	1,513 cf	25.25'W x 67.40'L x 3.50'H Prismatic 5,956 cf Overall - 2,174 cf Embedded = 3,782 cf x 40.0% Voids
#2	32.22'	2,174 cf	ADS_StormTech SC-740 @ 67.40' L x 5' Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 67.40'L = 434.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		3,687 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	28.76'	24.0" Round 24" SD L= 268.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 28.76' / 22.00' S= 0.0252 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	28.76'	4.0" Vert. 4" Orifice C= 0.600
#3	Device 1	32.90'	6.0" Vert. 6" Orifice C= 0.600
#4	Device 1	33.65'	4.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.89 cfs @ 12.35 hrs HW=33.01' (Free Discharge)

- 1=24" SD (Passes 0.89 cfs of 21.54 cfs potential flow)
- 2=4" Orifice (Orifice Controls 0.85 cfs @ 9.73 fps)
- 3=6" Orifice (Orifice Controls 0.04 cfs @ 1.14 fps)
- 4=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Summary for Pond W: WETLAND

Inflow Area = 917,965 sf, 33.62% Impervious, Inflow Depth = 1.18" for 2-Yr event
 Inflow = 13.72 cfs @ 12.55 hrs, Volume= 90,166 cf
 Outflow = 13.67 cfs @ 12.59 hrs, Volume= 90,166 cf, Atten= 0%, Lag= 2.4 min
 Primary = 13.67 cfs @ 12.59 hrs, Volume= 90,166 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 24.29' @ 12.59 hrs Surf.Area= 6,397 sf Storage= 1,005 cf

Plug-Flow detention time= 0.6 min calculated for 90,147 cf (100% of inflow)
 Center-of-Mass det. time= 0.6 min (885.7 - 885.1)

Volume	Invert	Avail.Storage	Storage Description
#1	23.90'	42,267 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.90	0	0	0
24.00	412	21	21
26.00	41,834	42,246	42,267

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Device	Routing	Invert	Outlet Devices
#1	Primary	23.90'	152.0 deg x 17.0' long Sharp-Crested Vee/Trap Weir Cv= 2.47 (C= 3.09)

Primary OutFlow Max=13.67 cfs @ 12.59 hrs HW=24.29' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 13.67 cfs @ 1.89 fps)

Summary for Link AP1: AP 1

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 1.39" for 2-Yr event
Inflow = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf
Primary = 16.14 cfs @ 12.54 hrs, Volume= 131,567 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP2: AP 2

Inflow Area = 4,698,353 sf, 15.58% Impervious, Inflow Depth = 1.25" for 2-Yr event
Inflow = 41.07 cfs @ 12.82 hrs, Volume= 488,500 cf
Primary = 41.07 cfs @ 12.82 hrs, Volume= 488,500 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Type III 24-hr 10-Yr Rainfall=4.90"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment OS1: OFFSITE SUB 1 Runoff Area=1,467,784 sf 3.67% Impervious Runoff Depth=1.96"
Flow Length=1,645' Tc=29.1 min CN=70 Runoff=43.39 cfs 240,042 cf

Subcatchment OS2: OFFSITE SUB 2 Runoff Area=913,125 sf 2.70% Impervious Runoff Depth=2.54"
Flow Length=1,654' Tc=58.8 min CN=77 Runoff=24.74 cfs 193,244 cf

Subcatchment S3: SUB 3 Runoff Area=836,116 sf 36.42% Impervious Runoff Depth=2.37"
Flow Length=828' Tc=39.2 min CN=75 Runoff=26.34 cfs 165,023 cf

Subcatchment S3.1: SUB 3.1 Runoff Area=41,451 sf 89.14% Impervious Runoff Depth=4.43"
Flow Length=160' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=4.65 cfs 15,313 cf

Subcatchment S3.2: SUB 3.2 Runoff Area=8,722 sf 9.15% Impervious Runoff Depth=2.90"
Flow Length=163' Slope=0.0220 '/' Tc=5.0 min CN=81 Runoff=0.70 cfs 2,106 cf

Subcatchment S3.3: SUB 3.3 Runoff Area=1,672 sf 27.51% Impervious Runoff Depth=2.63"
Tc=5.0 min CN=78 Runoff=0.12 cfs 366 cf

Subcatchment S4: SUB 4 Runoff Area=1,011,187 sf 18.65% Impervious Runoff Depth=2.81"
Flow Length=1,599' Tc=46.2 min CN=80 Runoff=34.84 cfs 236,432 cf

Subcatchment S4.1: SUB 4.1 Runoff Area=36,714 sf 95.49% Impervious Runoff Depth=4.55"
Flow Length=281' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=4.15 cfs 13,913 cf

Subcatchment S6: SUB 6 Runoff Area=132,680 sf 8.16% Impervious Runoff Depth=2.90"
Flow Length=616' Tc=13.5 min CN=81 Runoff=8.15 cfs 32,033 cf

Subcatchment S7: SUB 3 Runoff Area=167,053 sf 43.24% Impervious Runoff Depth=3.68"
Flow Length=1,081' Tc=10.0 min CN=89 Runoff=14.08 cfs 51,178 cf

Subcatchment S8: SUB 8 Runoff Area=81,849 sf 5.04% Impervious Runoff Depth=2.63"
Flow Length=399' Tc=21.1 min CN=78 Runoff=3.81 cfs 17,918 cf

Reach R1: REACH 1 Avg. Flow Depth=0.24' Max Vel=1.50 fps Inflow=12.07 cfs 240,033 cf
n=0.030 L=386.0' S=0.0104 '/' Capacity=256.49 cfs Outflow=12.06 cfs 240,032 cf

Reach R2: REACH 2 Avg. Flow Depth=0.28' Max Vel=1.61 fps Inflow=15.77 cfs 193,238 cf
n=0.030 L=527.0' S=0.0100 '/' Capacity=252.44 cfs Outflow=15.75 cfs 193,237 cf

Reach R3: REACH 3 Avg. Flow Depth=0.83' Max Vel=4.39 fps Inflow=27.77 cfs 433,269 cf
n=0.030 L=874.0' S=0.0138 '/' Capacity=141.56 cfs Outflow=27.76 cfs 433,266 cf

Reach R3.1: REACH 3.1 Avg. Flow Depth=0.04' Max Vel=0.54 fps Inflow=1.27 cfs 17,785 cf
n=0.025 L=179.0' S=0.0056 '/' Capacity=833.80 cfs Outflow=1.12 cfs 17,785 cf

Reach R3.2: REACH 3.2 Avg. Flow Depth=0.02' Max Vel=0.72 fps Inflow=0.83 cfs 2,472 cf
n=0.025 L=91.3' S=0.0219 '/' Capacity=1,651.08 cfs Outflow=0.79 cfs 2,472 cf

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Reach R4: REACH 4	Avg. Flow Depth=0.83' Max Vel=4.89 fps Inflow=31.17 cfs 251,905 cf n=0.030 L=144.0' S=0.0171 '/' Capacity=157.25 cfs Outflow=31.17 cfs 251,905 cf
Reach R4.1: REACH 4.1	Avg. Flow Depth=0.10' Max Vel=1.27 fps Inflow=1.86 cfs 13,912 cf n=0.030 L=552.0' S=0.0145 '/' Capacity=390.71 cfs Outflow=1.69 cfs 13,912 cf
Reach R5: REACH 5	Avg. Flow Depth=1.50' Max Vel=7.01 fps Inflow=84.48 cfs 935,515 cf n=0.025 L=317.0' S=0.0134 '/' Capacity=147.04 cfs Outflow=84.45 cfs 935,515 cf
Reach R6: REACH 6	Avg. Flow Depth=0.33' Max Vel=5.02 fps Inflow=29.61 cfs 200,727 cf n=0.025 L=133.0' S=0.0328 '/' Capacity=623.19 cfs Outflow=29.61 cfs 200,727 cf
Pond AP3: 4 - 24"CMP	Peak Elev=14.16' Storage=25,052 cf Inflow=86.10 cfs 967,547 cf Primary=80.71 cfs 967,522 cf Secondary=0.00 cfs 0 cf Outflow=80.71 cfs 967,522 cf
Pond C3: CULV-3	Peak Elev=33.24' Inflow=12.07 cfs 240,033 cf 24.0" Round Culvert n=0.013 L=169.0' S=0.0095 '/' Outflow=12.07 cfs 240,033 cf
Pond C4: CULV-4	Peak Elev=21.37' Inflow=31.17 cfs 251,905 cf 24.0" Round Culvert n=0.011 L=86.0' S=0.0050 '/' Outflow=31.17 cfs 251,905 cf
Pond C7: CULV-7	Peak Elev=22.46' Storage=3,393 cf Inflow=29.61 cfs 200,727 cf Primary=28.55 cfs 200,727 cf Secondary=0.00 cfs 0 cf Outflow=28.55 cfs 200,727 cf
Pond CB5: CB-5	Peak Elev=324.14' Inflow=0.12 cfs 366 cf 1.0" Round Culvert n=0.010 L=70.0' S=0.0050 '/' Outflow=0.12 cfs 366 cf
Pond CB6: CB-6	Peak Elev=28.35' Inflow=0.83 cfs 2,472 cf 12.0" Round Culvert n=0.013 L=184.0' S=0.0050 '/' Outflow=0.83 cfs 2,472 cf
Pond DMH-1: DMH-1	Peak Elev=33.54' Inflow=4.15 cfs 13,913 cf 24.0" Round Culvert n=0.010 L=30.0' S=0.0077 '/' Outflow=4.15 cfs 13,913 cf
Pond DMH-6: DMH-6	Peak Elev=31.05' Inflow=4.65 cfs 15,313 cf 24.0" Round Culvert n=0.010 L=6.0' S=0.2050 '/' Outflow=4.65 cfs 15,313 cf
Pond OC1: OFFSITE CULV-1	Peak Elev=36.29' Storage=84,783 cf Inflow=43.39 cfs 240,042 cf 18.0" Round Culvert n=0.013 L=97.6' S=0.0201 '/' Outflow=12.07 cfs 240,033 cf
Pond OC2: OFFSITE CULV-2	Peak Elev=36.39' Storage=34,167 cf Inflow=24.74 cfs 193,244 cf 18.0" Round Culvert n=0.013 L=93.6' S=0.0170 '/' Outflow=15.77 cfs 193,238 cf
Pond P3.1: STORMTECH DETENTION /	Peak Elev=30.35' Storage=6,107 cf Inflow=4.65 cfs 15,313 cf Outflow=0.67 cfs 15,313 cf
Pond P4.1: STORMTECH DETENTION /	Peak Elev=33.72' Storage=2,359 cf Inflow=4.15 cfs 13,913 cf Outflow=1.86 cfs 13,912 cf
Pond W: WETLAND	Peak Elev=24.52' Storage=3,039 cf Inflow=28.86 cfs 182,942 cf Outflow=28.65 cfs 182,942 cf

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Link AP1: AP 1

Inflow=31.17 cfs 251,905 cf

Primary=31.17 cfs 251,905 cf

Link AP2: AP 2

Inflow=80.71 cfs 967,522 cf

Primary=80.71 cfs 967,522 cf

Total Runoff Area = 4,698,353 sf Runoff Volume = 967,568 cf Average Runoff Depth = 2.47"
84.42% Pervious = 3,966,350 sf 15.58% Impervious = 732,003 sf

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Summary for Subcatchment OS1: OFFSITE SUB 1

Runoff = 43.39 cfs @ 12.42 hrs, Volume= 240,042 cf, Depth= 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
53,844	98	Paved parking & roofs
32,748	49	50-75% Grass cover, Fair, HSG A
12,803	79	50-75% Grass cover, Fair, HSG C
12,554	84	50-75% Grass cover, Fair, HSG D
205,440	30	Woods, Good, HSG A
228,765	70	Woods, Good, HSG C
921,630	77	Woods, Good, HSG D
1,467,784	70	Weighted Average
1,413,940		96.33% Pervious Area
53,844		3.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0430	0.25		Sheet Flow, A - B
					Range n= 0.130 P2= 3.00"
0.8	75	0.0510	1.58		Shallow Concentrated Flow, B -C
					Short Grass Pasture Kv= 7.0 fps
20.3	923	0.0230	0.76		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
1.4	547	0.0180	6.31	157.83	Channel Flow, D - E
					Area= 25.0 sf Perim= 27.0' r= 0.93'
					n= 0.030 Earth, grassed & winding
29.1	1,645	Total			

Summary for Subcatchment OS2: OFFSITE SUB 2

Runoff = 24.74 cfs @ 12.81 hrs, Volume= 193,244 cf, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
24,623	98	Paved parking & roofs
8,226	79	50-75% Grass cover, Fair, HSG C
13,667	84	50-75% Grass cover, Fair, HSG D
151,095	70	Woods, Good, HSG C
715,514	77	Woods, Good, HSG D
913,125	77	Weighted Average
888,502		97.30% Pervious Area
24,623		2.70% Impervious Area

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Type III 24-hr 10-Yr Rainfall=4.90"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0530	0.11		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
43.8	1,554	0.0140	0.59		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
58.8	1,654	Total			

Summary for Subcatchment S3: SUB 3

Runoff = 26.34 cfs @ 12.55 hrs, Volume= 165,023 cf, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
304,505	98	Paved parking & roofs
45,477	49	50-75% Grass cover, Fair, HSG A
10,125	79	50-75% Grass cover, Fair, HSG C
78,239	84	50-75% Grass cover, Fair, HSG D
142,893	30	Woods, Good, HSG A
81,209	70	Woods, Good, HSG C
173,668	77	Woods, Good, HSG D
836,116	75	Weighted Average
531,611		63.58% Pervious Area
304,505		36.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.0950	0.15		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.5	143	0.1000	1.58		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
21.3	535	0.0070	0.42		Shallow Concentrated Flow, C -D
					Woodland Kv= 5.0 fps
39.2	828	Total			

Summary for Subcatchment S3.1: SUB 3.1

Runoff = 4.65 cfs @ 12.07 hrs, Volume= 15,313 cf, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

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Type III 24-hr 10-Yr Rainfall=4.90"

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Area (sf)	CN	Description
36,951	98	Paved parking & roofs
3,700	79	50-75% Grass cover, Fair, HSG C
800	84	50-75% Grass cover, Fair, HSG D
41,451	96	Weighted Average
4,500		10.86% Pervious Area
36,951		89.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	160	0.0100	1.11		Sheet Flow, A - B
					Smooth surfaces n= 0.011 P2= 3.00"
2.6					Direct Entry, Min Tc
5.0	160	Total			

Summary for Subcatchment S3.2: SUB 3.2

Runoff = 0.70 cfs @ 12.07 hrs, Volume= 2,106 cf, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
798	98	Paved parking & roofs
7,924	79	50-75% Grass cover, Fair, HSG C
8,722	81	Weighted Average
7,924		90.85% Pervious Area
798		9.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	163	0.0220	1.04		Shallow Concentrated Flow, A - B
					Short Grass Pasture Kv= 7.0 fps
2.4					Direct Entry,
5.0	163	Total			

Summary for Subcatchment S3.3: SUB 3.3

Runoff = 0.12 cfs @ 12.08 hrs, Volume= 366 cf, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
460	98	Paved parking & roofs
1,212	70	Woods, Good, HSG C
1,672	78	Weighted Average
1,212		72.49% Pervious Area
460		27.51% Impervious Area

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Type III 24-hr 10-Yr Rainfall=4.90"

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

Summary for Subcatchment S4: SUB 4

Runoff = 34.84 cfs @ 12.63 hrs, Volume= 236,432 cf, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
188,582	98	Paved parking & roofs
20,781	79	50-75% Grass cover, Fair, HSG C
11,998	84	50-75% Grass cover, Fair, HSG D
419,188	73	Woods, Fair, HSG C
370,638	79	Woods, Fair, HSG D
1,011,187	80	Weighted Average
822,605		81.35% Pervious Area
188,582		18.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.3	100	0.0100	0.06		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.9	284	0.0600	1.22		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
10.4	341	0.0120	0.55		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
2.6	874	0.0140	5.64	281.88	Channel Flow, D - E
					Area= 50.0 sf Perim= 53.0' r= 0.94'
					n= 0.030 Earth, grassed & winding
46.2	1,599	Total			

Summary for Subcatchment S4.1: SUB 4.1

Runoff = 4.15 cfs @ 12.07 hrs, Volume= 13,913 cf, Depth= 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
35,058	98	Paved parking & roofs
1,656	74	>75% Grass cover, Good, HSG C
36,714	97	Weighted Average
1,656		4.51% Pervious Area
35,058		95.49% Impervious Area

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Type III 24-hr 10-Yr Rainfall=4.90"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	200	0.0100	1.16		Sheet Flow, A - B Smooth surfaces n= 0.011 P2= 3.00"
0.7	81	0.0100	2.03		Shallow Concentrated Flow, B - C Paved Kv= 20.3 fps
1.4					Direct Entry, Min Tc
5.0	281	Total			

Summary for Subcatchment S6: SUB 6

Runoff = 8.15 cfs @ 12.19 hrs, Volume= 32,033 cf, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
10,824	98	Paved parking & roofs
19,401	79	50-75% Grass cover, Fair, HSG C
64,092	84	50-75% Grass cover, Fair, HSG D
32,603	70	Woods, Good, HSG C
5,760	77	Woods, Good, HSG D
132,680	81	Weighted Average
121,856		91.84% Pervious Area
10,824		8.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	40	0.0410	0.08		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	71	0.1120	1.67		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
4.5	265	0.0380	0.97		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
0.3	240	0.0250	11.44	686.23	Channel Flow, C - D Area= 60.0 sf Perim= 34.0' r= 1.76' n= 0.030 Earth, grassed & winding
13.5	616	Total			

Summary for Subcatchment S7: SUB 3

Runoff = 14.08 cfs @ 12.14 hrs, Volume= 51,178 cf, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

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Type III 24-hr 10-Yr Rainfall=4.90"

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Area (sf)	CN	Description
72,236	98	Paved parking & roofs
66,092	84	50-75% Grass cover, Fair, HSG D
5,176	73	Woods, Fair, HSG C
23,549	79	Woods, Fair, HSG D
167,053	89	Weighted Average
94,817		56.76% Pervious Area
72,236		43.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	58	0.0430	0.20		Sheet Flow, A - B Grass: Short n= 0.150 P2= 3.00"
1.1	136	0.0840	2.03		Shallow Concentrated Flow, B - C Short Grass Pasture Kv= 7.0 fps
2.8	424	0.0150	2.49		Shallow Concentrated Flow, C - D Paved Kv= 20.3 fps
0.1	39	0.0450	9.55	3.33	Pipe Channel, D - E 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
0.3	185	0.0380	11.66	116.60	Channel Flow, E - F Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.5	137	0.0168	4.82	0.95	Pipe Channel, F - G 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
0.4	102	0.0042	4.67	14.66	Pipe Channel, G - H 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
10.0	1,081	Total			

Summary for Subcatchment S8: SUB 8

Runoff = 3.81 cfs @ 12.30 hrs, Volume= 17,918 cf, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Yr Rainfall=4.90"

Area (sf)	CN	Description
4,122	98	Paved parking & roofs
439	79	50-75% Grass cover, Fair, HSG C
34,658	74	>75% Grass cover, Good, HSG C
4,166	73	Woods, Fair, HSG C
38,464	79	Woods, Fair, HSG D
81,849	78	Weighted Average
77,727		94.96% Pervious Area
4,122		5.04% Impervious Area

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Type III 24-hr 10-Yr Rainfall=4.90"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	120	0.0500	0.11		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
1.4	138	0.1100	1.66		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
1.9	141	0.0320	1.25		Shallow Concentrated Flow, C - D Short Grass Pasture Kv= 7.0 fps
21.1	399	Total			

Summary for Reach R1: REACH 1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 1.96" for 10-Yr event
 Inflow = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf
 Outflow = 12.06 cfs @ 13.29 hrs, Volume= 240,032 cf, Atten= 0%, Lag= 7.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.50 fps, Min. Travel Time= 4.3 min
 Avg. Velocity = 0.53 fps, Avg. Travel Time= 12.2 min

Peak Storage= 3,099 cf @ 13.22 hrs
 Average Depth at Peak Storage= 0.24'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 256.49 cfs

100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
 Length= 386.0' Slope= 0.0104 '/'
 Inlet Invert= 30.00', Outlet Invert= 26.00'

**Summary for Reach R2: REACH 2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 2.54" for 10-Yr event
 Inflow = 15.77 cfs @ 13.31 hrs, Volume= 193,238 cf
 Outflow = 15.75 cfs @ 13.46 hrs, Volume= 193,237 cf, Atten= 0%, Lag= 9.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.61 fps, Min. Travel Time= 5.4 min
 Avg. Velocity = 0.47 fps, Avg. Travel Time= 18.7 min

Peak Storage= 5,145 cf @ 13.37 hrs
 Average Depth at Peak Storage= 0.28'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 252.44 cfs

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100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 527.0' Slope= 0.0100 '/'
Inlet Invert= 31.29', Outlet Invert= 26.00'



Summary for Reach R3: REACH 3

Inflow Area = 2,380,909 sf, 3.30% Impervious, Inflow Depth = 2.18" for 10-Yr event
Inflow = 27.77 cfs @ 13.43 hrs, Volume= 433,269 cf
Outflow = 27.76 cfs @ 13.52 hrs, Volume= 433,266 cf, Atten= 0%, Lag= 5.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.39 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.29 fps, Avg. Travel Time= 11.3 min

Peak Storage= 5,533 cf @ 13.47 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 141.56 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 874.0' Slope= 0.0138 '/'
Inlet Invert= 26.00', Outlet Invert= 13.90'



Summary for Reach R3.1: REACH 3.1

Inflow Area = 51,845 sf, 73.70% Impervious, Inflow Depth = 4.12" for 10-Yr event
Inflow = 1.27 cfs @ 12.14 hrs, Volume= 17,785 cf
Outflow = 1.12 cfs @ 12.32 hrs, Volume= 17,785 cf, Atten= 12%, Lag= 10.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.54 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 0.34 fps, Avg. Travel Time= 8.7 min

Peak Storage= 375 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 833.80 cfs

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50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 179.0' Slope= 0.0056 '/'
Inlet Invert= 24.90', Outlet Invert= 23.90'



Summary for Reach R3.2: REACH 3.2

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 2.85" for 10-Yr event
Inflow = 0.83 cfs @ 12.07 hrs, Volume= 2,472 cf
Outflow = 0.79 cfs @ 12.13 hrs, Volume= 2,472 cf, Atten= 4%, Lag= 3.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.72 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 2.4 min

Peak Storage= 101 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 1,651.08 cfs

50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 91.3' Slope= 0.0219 '/'
Inlet Invert= 26.90', Outlet Invert= 24.90'



Summary for Reach R4: REACH 4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 2.66" for 10-Yr event
Inflow = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf
Outflow = 31.17 cfs @ 12.58 hrs, Volume= 251,905 cf, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.89 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 1.5 min

Peak Storage= 918 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 157.25 cfs

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6.00' x 2.00' deep channel, $n = 0.030$ Stream, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 14.00'

Length= 144.0' Slope= 0.0171 ' '

Inlet Invert= 16.36', Outlet Invert= 13.90'



Summary for Reach R4.1: REACH 4.1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 4.55" for 10-Yr event

Inflow = 1.86 cfs @ 12.22 hrs, Volume= 13,912 cf

Outflow = 1.69 cfs @ 12.43 hrs, Volume= 13,912 cf, Atten= 10%, Lag= 12.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 1.27 fps, Min. Travel Time= 7.3 min

Avg. Velocity = 0.51 fps, Avg. Travel Time= 18.0 min

Peak Storage= 735 cf @ 12.31 hrs

Average Depth at Peak Storage= 0.10'

Bank-Full Depth= 2.00' Flow Area= 56.0 sf, Capacity= 390.71 cfs

12.00' x 2.00' deep channel, $n = 0.030$ Earth, grassed & winding

Side Slope Z-value= 8.0 ' ' Top Width= 44.00'

Length= 552.0' Slope= 0.0145 ' '

Inlet Invert= 22.00', Outlet Invert= 14.00'



Summary for Reach R5: REACH 5

Inflow Area = 4,565,673 sf, 15.80% Impervious, Inflow Depth = 2.46" for 10-Yr event

Inflow = 84.48 cfs @ 12.73 hrs, Volume= 935,515 cf

Outflow = 84.45 cfs @ 12.75 hrs, Volume= 935,515 cf, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 7.01 fps, Min. Travel Time= 0.8 min

Avg. Velocity = 1.71 fps, Avg. Travel Time= 3.1 min

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Peak Storage= 3,817 cf @ 12.74 hrs

Average Depth at Peak Storage= 1.50'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 147.04 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 13.00'

Length= 317.0' Slope= 0.0134 ' '

Inlet Invert= 13.90', Outlet Invert= 9.64'



Summary for Reach R6: REACH 6

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 2.48" for 10-Yr event

Inflow = 29.61 cfs @ 12.57 hrs, Volume= 200,727 cf

Outflow = 29.61 cfs @ 12.58 hrs, Volume= 200,727 cf, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 5.02 fps, Min. Travel Time= 0.4 min

Avg. Velocity = 1.50 fps, Avg. Travel Time= 1.5 min

Peak Storage= 784 cf @ 12.58 hrs

Average Depth at Peak Storage= 0.33'

Bank-Full Depth= 2.00' Flow Area= 42.0 sf, Capacity= 623.19 cfs

17.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 2.0 ' ' Top Width= 25.00'

Length= 133.0' Slope= 0.0328 ' '

Inlet Invert= 23.90', Outlet Invert= 19.54'



Summary for Pond AP3: 4 - 24"CMP

Inflow Area = 4,698,353 sf, 15.58% Impervious, Inflow Depth = 2.47" for 10-Yr event

Inflow = 86.10 cfs @ 12.74 hrs, Volume= 967,547 cf

Outflow = 80.71 cfs @ 12.91 hrs, Volume= 967,522 cf, Atten= 6%, Lag= 10.0 min

Primary = 80.71 cfs @ 12.91 hrs, Volume= 967,522 cf

Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 6

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Peak Elev= 14.16' @ 12.91 hrs Surf.Area= 15,657 sf Storage= 25,052 cf

Plug-Flow detention time= 2.6 min calculated for 967,522 cf (100% of inflow)

Center-of-Mass det. time= 2.6 min (905.3 - 902.8)

Volume	Invert	Avail.Storage	Storage Description
#1	9.64'	96,037 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.64	0	0	0
10.00	856	154	154
12.00	4,037	4,893	5,047
14.00	13,588	17,625	22,672
16.00	39,016	52,604	75,276
16.50	44,026	20,761	96,037

Device	Routing	Invert	Outlet Devices
#1	Primary	9.77'	24.0" Round Proposed 3 - 24" CMP X 3.00 L= 65.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.12' S= 0.0100 ' / Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Primary	9.83'	24.0" Round Existing 24" CMP L= 64.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.83' S= -0.0009 ' / Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#3	Secondary	16.50'	20.0' long x 25.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=80.71 cfs @ 12.91 hrs HW=14.16' (Free Discharge)

1=Proposed 3 - 24" CMP (Barrel Controls 62.22 cfs @ 6.60 fps)


2=Existing 24" CMP (Barrel Controls 18.49 cfs @ 5.88 fps)
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=9.64' (Free Discharge)

3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
Summary for Pond C3: CULV-3

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 1.96" for 10-Yr event
 Inflow = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf
 Outflow = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf, Atten= 0%, Lag= 0.0 min
 Primary = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.24' @ 13.17 hrs

Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.60'	24.0" Round Culvert L= 169.0' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 31.60' / 30.00' S= 0.0095 ' /' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 3.14 sf

Primary OutFlow Max=12.07 cfs @ 13.17 hrs HW=33.24' TW=31.60' (Fixed TW Elev= 31.60')

↑**1=Culvert** (Outlet Controls 12.07 cfs @ 5.94 fps)

Summary for Pond C4: CULV-4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 2.66" for 10-Yr event
 Inflow = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf
 Outflow = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf, Atten= 0%, Lag= 0.0 min
 Primary = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 21.37' @ 12.57 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.79'	24.0" Round Culvert L= 86.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 16.79' / 16.36' S= 0.0050 ' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=31.17 cfs @ 12.57 hrs HW=21.37' (Free Discharge)

↑**1=Culvert** (Barrel Controls 31.17 cfs @ 9.92 fps)

Summary for Pond C7: CULV-7

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 2.48" for 10-Yr event
 Inflow = 29.61 cfs @ 12.58 hrs, Volume= 200,727 cf
 Outflow = 28.55 cfs @ 12.68 hrs, Volume= 200,727 cf, Atten= 4%, Lag= 5.8 min
 Primary = 28.55 cfs @ 12.68 hrs, Volume= 200,727 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 22.46' @ 12.68 hrs Surf.Area= 4,096 sf Storage= 3,393 cf

Plug-Flow detention time= 0.8 min calculated for 200,685 cf (100% of inflow)
 Center-of-Mass det. time= 0.8 min (870.5 - 869.7)

Volume	Invert	Avail.Storage	Storage Description
#1	19.54'	9,728 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.54	0	0	0
20.00	144	33	33
21.00	890	517	550
22.00	2,015	1,453	2,003
23.00	6,588	4,302	6,304
23.50	7,106	3,424	9,728

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Device	Routing	Invert	Outlet Devices
#1	Primary	19.54'	24.0" Round 24" RCP L= 184.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 19.54' / 16.79' S= 0.0149 ' S= 0.0149 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	23.40'	250.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=28.54 cfs @ 12.68 hrs HW=22.46' (Free Discharge)

↑1=24" RCP (Inlet Controls 28.54 cfs @ 9.09 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=19.54' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond CB5: CB-5

Inflow Area = 1,672 sf, 27.51% Impervious, Inflow Depth = 2.63" for 10-Yr event
 Inflow = 0.12 cfs @ 12.08 hrs, Volume= 366 cf
 Outflow = 0.12 cfs @ 12.08 hrs, Volume= 366 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.12 cfs @ 12.08 hrs, Volume= 366 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 324.14' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	29.50'	1.0" Round 12" CULV L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.50' / 29.15' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.01 sf

Primary OutFlow Max=0.12 cfs @ 12.08 hrs HW=322.93' (Free Discharge)

↑1=12" CULV (Barrel Controls 0.12 cfs @ 22.43 fps)

Summary for Pond CB6: CB-6

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 2.85" for 10-Yr event
 Inflow = 0.83 cfs @ 12.07 hrs, Volume= 2,472 cf
 Outflow = 0.83 cfs @ 12.07 hrs, Volume= 2,472 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.83 cfs @ 12.07 hrs, Volume= 2,472 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 28.35' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.82'	12.0" Round 12"SD L= 184.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 27.82' / 26.90' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 0.79 sf

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Primary OutFlow Max=0.83 cfs @ 12.07 hrs HW=28.35' (Free Discharge)

↑1=12"SD (Barrel Controls 0.83 cfs @ 2.85 fps)

Summary for Pond DMH-1: DMH-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 4.55" for 10-Yr event
 Inflow = 4.15 cfs @ 12.07 hrs, Volume= 13,913 cf
 Outflow = 4.15 cfs @ 12.07 hrs, Volume= 13,913 cf, Atten= 0%, Lag= 0.0 min
 Primary = 4.15 cfs @ 12.07 hrs, Volume= 13,913 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.54' @ 12.07 hrs

Flood Elev= 36.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.58'	24.0" Round 24" SD to Detention Bed L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 32.58' / 32.35' S= 0.0077 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.15 cfs @ 12.07 hrs HW=33.54' (Free Discharge)

↑1=24" SD to Detention Bed (Barrel Controls 4.15 cfs @ 4.09 fps)

Summary for Pond DMH-6: DMH-6

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 4.43" for 10-Yr event
 Inflow = 4.65 cfs @ 12.07 hrs, Volume= 15,313 cf
 Outflow = 4.65 cfs @ 12.07 hrs, Volume= 15,313 cf, Atten= 0%, Lag= 0.0 min
 Primary = 4.65 cfs @ 12.07 hrs, Volume= 15,313 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 31.05' @ 12.07 hrs

Flood Elev= 32.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	30.13'	24.0" Round 24" SD to Detention Bed L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 30.13' / 28.90' S= 0.2050 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.64 cfs @ 12.07 hrs HW=31.05' (Free Discharge)

↑1=24" SD to Detention Bed (Inlet Controls 4.64 cfs @ 3.27 fps)

Summary for Pond OC1: OFFSITE CULV-1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 1.96" for 10-Yr event
 Inflow = 43.39 cfs @ 12.42 hrs, Volume= 240,042 cf
 Outflow = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf, Atten= 72%, Lag= 44.6 min
 Primary = 12.07 cfs @ 13.17 hrs, Volume= 240,033 cf

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Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 36.29' @ 13.17 hrs Surf.Area= 77,683 sf Storage= 84,783 cf

Plug-Flow detention time= 91.3 min calculated for 239,983 cf (100% of inflow)

Center-of-Mass det. time= 91.4 min (961.6 - 870.2)

Volume	Invert	Avail.Storage	Storage Description
#1	34.25'	602,689 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.25	5,289	0	0
36.00	67,698	63,864	63,864
38.00	137,090	204,788	268,652
40.00	196,947	334,037	602,689

Device	Routing	Invert	Outlet Devices
#1	Primary	34.25'	18.0" Round 18" RCP L= 97.6' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 34.25' / 32.29' S= 0.0201 ' S= 0.0201 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=12.07 cfs @ 13.17 hrs HW=36.29' (Free Discharge)↑ **1=18" RCP** (Inlet Controls 12.07 cfs @ 6.83 fps)**Summary for Pond OC2: OFFSITE CULV-2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 2.54" for 10-Yr event
 Inflow = 24.74 cfs @ 12.81 hrs, Volume= 193,244 cf
 Outflow = 15.77 cfs @ 13.31 hrs, Volume= 193,238 cf, Atten= 36%, Lag= 30.0 min
 Primary = 15.77 cfs @ 13.31 hrs, Volume= 193,238 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 36.39' @ 13.31 hrs Surf.Area= 15,927 sf Storage= 34,167 cf

Plug-Flow detention time= 30.2 min calculated for 193,238 cf (100% of inflow)

Center-of-Mass det. time= 30.1 min (909.7 - 879.6)

Volume	Invert	Avail.Storage	Storage Description
#1	32.88'	71,548 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.88	5,285	0	0
34.00	8,520	7,731	7,731
36.00	12,392	20,912	28,643
38.00	30,513	42,905	71,548

Device	Routing	Invert	Outlet Devices
#1	Primary	32.88'	18.0" Round 18" RCP L= 93.6' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 32.88' / 31.29' S= 0.0170 ' / ' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=15.77 cfs @ 13.31 hrs HW=36.39' (Free Discharge)

↑ **1=18" RCP** (Barrel Controls 15.77 cfs @ 8.92 fps)

Summary for Pond P3.1: STORMTECH DETENTION / OCS-2

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 4.43" for 10-Yr event
 Inflow = 4.65 cfs @ 12.07 hrs, Volume= 15,313 cf
 Outflow = 0.67 cfs @ 12.55 hrs, Volume= 15,313 cf, Atten= 86%, Lag= 28.9 min
 Primary = 0.67 cfs @ 12.55 hrs, Volume= 15,313 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 30.35' @ 12.55 hrs Surf.Area= 3,328 sf Storage= 6,107 cf
 Flood Elev= 31.21' Surf.Area= 3,328 sf Storage= 7,258 cf

Plug-Flow detention time= 135.9 min calculated for 15,313 cf (100% of inflow)
 Center-of-Mass det. time= 135.9 min (897.9 - 761.9)

Volume	Invert	Avail.Storage	Storage Description
#1	27.67'	2,926 cf	34.70'W x 95.90'L x 3.50'H Prismatoid 11,647 cf Overall - 4,331 cf Embedded = 7,316 cf x 40.0% Voids
#2	28.17'	4,331 cf	ADS_StormTech SC-740 @ 95.90' L x 7 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 95.90'L = 618.8 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		7,258 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	25.15'	24.0" Round 24" SD L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 25.15' / 25.00' S= 0.0100 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	25.15'	2.0" Vert. 2" Orifice C= 0.600
#3	Device 1	29.12'	4.0" Vert. 4" Orifice C= 0.600
#4	Device 1	30.90'	6.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.67 cfs @ 12.55 hrs HW=30.35' (Free Discharge)

↑ **1=24" SD** (Passes 0.67 cfs of 24.47 cfs potential flow)
 ↑ **2=2" Orifice** (Orifice Controls 0.24 cfs @ 10.89 fps)
 ↑ **3=4" Orifice** (Orifice Controls 0.43 cfs @ 4.96 fps)
 ↑ **4=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond P4.1: STORMTECH DETENTION / OCS-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 4.55" for 10-Yr event
 Inflow = 4.15 cfs @ 12.07 hrs, Volume= 13,913 cf
 Outflow = 1.86 cfs @ 12.22 hrs, Volume= 13,912 cf, Atten= 55%, Lag= 9.2 min
 Primary = 1.86 cfs @ 12.22 hrs, Volume= 13,912 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

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Peak Elev= 33.72' @ 12.22 hrs Surf.Area= 1,702 sf Storage= 2,359 cf
 Flood Elev= 34.78' Surf.Area= 1,702 sf Storage= 3,388 cf

Plug-Flow detention time= 9.8 min calculated for 13,910 cf (100% of inflow)
 Center-of-Mass det. time= 9.8 min (765.1 - 755.3)

Volume	Invert	Avail.Storage	Storage Description
#1	31.72'	1,513 cf	25.25'W x 67.40'L x 3.50'H Prismatic 5,956 cf Overall - 2,174 cf Embedded = 3,782 cf x 40.0% Voids
#2	32.22'	2,174 cf	ADS_StormTech SC-740 @ 67.40' L x 5 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 67.40'L = 434.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		3,687 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	28.76'	24.0" Round 24" SD L= 268.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 28.76' / 22.00' S= 0.0252 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	28.76'	4.0" Vert. 4" Orifice C= 0.600
#3	Device 1	32.90'	6.0" Vert. 6" Orifice C= 0.600
#4	Device 1	33.65'	4.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=1.86 cfs @ 12.22 hrs HW=33.72' (Free Discharge)

- 1=24" SD (Passes 1.86 cfs of 23.76 cfs potential flow)
- 2=4" Orifice (Orifice Controls 0.92 cfs @ 10.54 fps)
- 3=6" Orifice (Orifice Controls 0.71 cfs @ 3.63 fps)
- 4=Sharp-Crested Vee/Trap Weir (Weir Controls 0.23 cfs @ 0.85 fps)

Summary for Pond W: WETLAND

Inflow Area = 917,965 sf, 33.62% Impervious, Inflow Depth = 2.39" for 10-Yr event
 Inflow = 28.86 cfs @ 12.54 hrs, Volume= 182,942 cf
 Outflow = 28.65 cfs @ 12.57 hrs, Volume= 182,942 cf, Atten= 1%, Lag= 2.0 min
 Primary = 28.65 cfs @ 12.57 hrs, Volume= 182,942 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 24.52' @ 12.57 hrs Surf.Area= 11,189 sf Storage= 3,039 cf

Plug-Flow detention time= 0.9 min calculated for 182,904 cf (100% of inflow)
 Center-of-Mass det. time= 0.9 min (865.2 - 864.2)

Volume	Invert	Avail.Storage	Storage Description
#1	23.90'	42,267 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.90	0	0	0
24.00	412	21	21
26.00	41,834	42,246	42,267

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Device	Routing	Invert	Outlet Devices
#1	Primary	23.90'	152.0 deg x 17.0' long Sharp-Crested Vee/Trap Weir Cv= 2.47 (C= 3.09)

Primary OutFlow Max=28.65 cfs @ 12.57 hrs HW=24.52' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 28.65 cfs @ 2.37 fps)

Summary for Link AP1: AP 1

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 2.66" for 10-Yr event
Inflow = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf
Primary = 31.17 cfs @ 12.57 hrs, Volume= 251,905 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP2: AP 2

Inflow Area = 4,698,353 sf, 15.58% Impervious, Inflow Depth = 2.47" for 10-Yr event
Inflow = 80.71 cfs @ 12.91 hrs, Volume= 967,522 cf
Primary = 80.71 cfs @ 12.91 hrs, Volume= 967,522 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment OS1: OFFSITE SUB 1 Runoff Area=1,467,784 sf 3.67% Impervious Runoff Depth=2.96"
Flow Length=1,645' Tc=29.1 min CN=70 Runoff=66.68 cfs 362,632 cf

Subcatchment OS2: OFFSITE SUB 2 Runoff Area=913,125 sf 2.70% Impervious Runoff Depth=3.65"
Flow Length=1,654' Tc=58.8 min CN=77 Runoff=35.70 cfs 278,070 cf

Subcatchment S3: SUB 3 Runoff Area=836,116 sf 36.42% Impervious Runoff Depth=3.45"
Flow Length=828' Tc=39.2 min CN=75 Runoff=38.62 cfs 240,602 cf

Subcatchment S3.1: SUB 3.1 Runoff Area=41,451 sf 89.14% Impervious Runoff Depth=5.73"
Flow Length=160' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=5.92 cfs 19,781 cf

Subcatchment S3.2: SUB 3.2 Runoff Area=8,722 sf 9.15% Impervious Runoff Depth=4.07"
Flow Length=163' Slope=0.0220 '/' Tc=5.0 min CN=81 Runoff=0.98 cfs 2,956 cf

Subcatchment S3.3: SUB 3.3 Runoff Area=1,672 sf 27.51% Impervious Runoff Depth=3.76"
Tc=5.0 min CN=78 Runoff=0.17 cfs 523 cf

Subcatchment S4: SUB 4 Runoff Area=1,011,187 sf 18.65% Impervious Runoff Depth=3.96"
Flow Length=1,599' Tc=46.2 min CN=80 Runoff=49.08 cfs 333,877 cf

Subcatchment S4.1: SUB 4.1 Runoff Area=36,714 sf 95.49% Impervious Runoff Depth=5.84"
Flow Length=281' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=5.28 cfs 17,879 cf

Subcatchment S6: SUB 6 Runoff Area=132,680 sf 8.16% Impervious Runoff Depth=4.07"
Flow Length=616' Tc=13.5 min CN=81 Runoff=11.37 cfs 44,961 cf

Subcatchment S7: SUB 3 Runoff Area=167,053 sf 43.24% Impervious Runoff Depth=4.93"
Flow Length=1,081' Tc=10.0 min CN=89 Runoff=18.60 cfs 68,622 cf

Subcatchment S8: SUB 8 Runoff Area=81,849 sf 5.04% Impervious Runoff Depth=3.76"
Flow Length=399' Tc=21.1 min CN=78 Runoff=5.45 cfs 25,620 cf

Reach R1: REACH 1 Avg. Flow Depth=0.27' Max Vel=1.59 fps Inflow=14.59 cfs 362,623 cf
n=0.030 L=386.0' S=0.0104 '/' Capacity=256.49 cfs Outflow=14.59 cfs 362,621 cf

Reach R2: REACH 2 Avg. Flow Depth=0.30' Max Vel=1.69 fps Inflow=18.37 cfs 278,064 cf
n=0.030 L=527.0' S=0.0100 '/' Capacity=252.44 cfs Outflow=18.35 cfs 278,063 cf

Reach R3: REACH 3 Avg. Flow Depth=0.91' Max Vel=4.63 fps Inflow=32.93 cfs 640,684 cf
n=0.030 L=874.0' S=0.0138 '/' Capacity=141.56 cfs Outflow=32.92 cfs 640,681 cf

Reach R3.1: REACH 3.1 Avg. Flow Depth=0.07' Max Vel=0.76 fps Inflow=2.89 cfs 23,260 cf
n=0.025 L=179.0' S=0.0056 '/' Capacity=833.80 cfs Outflow=2.70 cfs 23,260 cf

Reach R3.2: REACH 3.2 Avg. Flow Depth=0.03' Max Vel=0.84 fps Inflow=1.16 cfs 3,479 cf
n=0.025 L=91.3' S=0.0219 '/' Capacity=1,651.08 cfs Outflow=1.13 cfs 3,479 cf

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Reach R4: REACH 4	Avg. Flow Depth=1.06' Max Vel=5.59 fps Inflow=48.21 cfs 358,096 cf n=0.030 L=144.0' S=0.0171 '/' Capacity=157.25 cfs Outflow=48.14 cfs 358,096 cf
Reach R4.1: REACH 4.1	Avg. Flow Depth=0.15' Max Vel=1.57 fps Inflow=3.99 cfs 17,880 cf n=0.030 L=552.0' S=0.0145 '/' Capacity=390.71 cfs Outflow=3.05 cfs 17,880 cf
Reach R5: REACH 5	Avg. Flow Depth=1.80' Max Vel=7.72 fps Inflow=119.28 cfs 1,350,533 cf n=0.025 L=317.0' S=0.0134 '/' Capacity=147.04 cfs Outflow=119.24 cfs 1,350,532 cf
Reach R6: REACH 6	Avg. Flow Depth=0.42' Max Vel=5.82 fps Inflow=43.76 cfs 289,481 cf n=0.025 L=133.0' S=0.0328 '/' Capacity=623.19 cfs Outflow=43.76 cfs 289,481 cf
Pond AP3: 4 - 24"CMP	Peak Elev=15.68' Storage=63,328 cf Inflow=122.25 cfs 1,395,494 cf Primary=99.77 cfs 1,395,479 cf Secondary=0.00 cfs 0 cf Outflow=99.77 cfs 1,395,479 cf
Pond C3: CULV-3	Peak Elev=33.42' Inflow=14.59 cfs 362,623 cf 24.0" Round Culvert n=0.013 L=169.0' S=0.0095 '/' Outflow=14.59 cfs 362,623 cf
Pond C4: CULV-4	Peak Elev=25.56' Inflow=48.21 cfs 358,096 cf 24.0" Round Culvert n=0.011 L=86.0' S=0.0050 '/' Outflow=48.21 cfs 358,096 cf
Pond C7: CULV-7	Peak Elev=23.47' Storage=9,483 cf Inflow=43.76 cfs 289,481 cf Primary=32.92 cfs 280,765 cf Secondary=10.80 cfs 8,708 cf Outflow=43.72 cfs 289,474 cf
Pond CB5: CB-5	Peak Elev=629.89' Inflow=0.17 cfs 523 cf 1.0" Round Culvert n=0.010 L=70.0' S=0.0050 '/' Outflow=0.17 cfs 523 cf
Pond CB6: CB-6	Peak Elev=28.46' Inflow=1.16 cfs 3,479 cf 12.0" Round Culvert n=0.013 L=184.0' S=0.0050 '/' Outflow=1.16 cfs 3,479 cf
Pond DMH-1: DMH-1	Peak Elev=33.68' Inflow=5.28 cfs 17,879 cf 24.0" Round Culvert n=0.010 L=30.0' S=0.0077 '/' Outflow=5.28 cfs 17,879 cf
Pond DMH-6: DMH-6	Peak Elev=31.19' Inflow=5.92 cfs 19,781 cf 24.0" Round Culvert n=0.010 L=6.0' S=0.2050 '/' Outflow=5.92 cfs 19,781 cf
Pond OC1: OFFSITE CULV-1	Peak Elev=36.95' Storage=143,927 cf Inflow=66.68 cfs 362,632 cf 18.0" Round Culvert n=0.013 L=97.6' S=0.0201 '/' Outflow=14.59 cfs 362,623 cf
Pond OC2: OFFSITE CULV-2	Peak Elev=37.67' Storage=62,087 cf Inflow=35.70 cfs 278,070 cf 18.0" Round Culvert n=0.013 L=93.6' S=0.0170 '/' Outflow=18.37 cfs 278,064 cf
Pond P3.1: STORMTECH DETENTION /	Peak Elev=31.08' Storage=7,136 cf Inflow=5.92 cfs 19,781 cf Outflow=2.30 cfs 19,781 cf
Pond P4.1: STORMTECH DETENTION /	Peak Elev=33.95' Storage=2,637 cf Inflow=5.28 cfs 17,879 cf Outflow=3.99 cfs 17,880 cf
Pond W: WETLAND	Peak Elev=24.68' Storage=5,150 cf Inflow=42.30 cfs 266,221 cf Outflow=41.85 cfs 266,221 cf

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Type III 24-hr 25-Yr Rainfall=6.20"

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Link AP1: AP 1

Inflow=48.21 cfs 358,096 cf

Primary=48.21 cfs 358,096 cf

Link AP2: AP 2

Inflow=99.77 cfs 1,395,479 cf

Primary=99.77 cfs 1,395,479 cf

Total Runoff Area = 4,698,353 sf Runoff Volume = 1,395,522 cf Average Runoff Depth = 3.56"
84.42% Pervious = 3,966,350 sf 15.58% Impervious = 732,003 sf

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Summary for Subcatchment OS1: OFFSITE SUB 1

Runoff = 66.68 cfs @ 12.41 hrs, Volume= 362,632 cf, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
53,844	98	Paved parking & roofs
32,748	49	50-75% Grass cover, Fair, HSG A
12,803	79	50-75% Grass cover, Fair, HSG C
12,554	84	50-75% Grass cover, Fair, HSG D
205,440	30	Woods, Good, HSG A
228,765	70	Woods, Good, HSG C
921,630	77	Woods, Good, HSG D
1,467,784	70	Weighted Average
1,413,940		96.33% Pervious Area
53,844		3.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0430	0.25		Sheet Flow, A - B Range n= 0.130 P2= 3.00"
0.8	75	0.0510	1.58		Shallow Concentrated Flow, B -C Short Grass Pasture Kv= 7.0 fps
20.3	923	0.0230	0.76		Shallow Concentrated Flow, C - D Woodland Kv= 5.0 fps
1.4	547	0.0180	6.31	157.83	Channel Flow, D - E Area= 25.0 sf Perim= 27.0' r= 0.93' n= 0.030 Earth, grassed & winding
29.1	1,645	Total			

Summary for Subcatchment OS2: OFFSITE SUB 2

Runoff = 35.70 cfs @ 12.80 hrs, Volume= 278,070 cf, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
24,623	98	Paved parking & roofs
8,226	79	50-75% Grass cover, Fair, HSG C
13,667	84	50-75% Grass cover, Fair, HSG D
151,095	70	Woods, Good, HSG C
715,514	77	Woods, Good, HSG D
913,125	77	Weighted Average
888,502		97.30% Pervious Area
24,623		2.70% Impervious Area

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Type III 24-hr 25-Yr Rainfall=6.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0530	0.11		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
43.8	1,554	0.0140	0.59		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
58.8	1,654	Total			

Summary for Subcatchment S3: SUB 3

Runoff = 38.62 cfs @ 12.54 hrs, Volume= 240,602 cf, Depth= 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
304,505	98	Paved parking & roofs
45,477	49	50-75% Grass cover, Fair, HSG A
10,125	79	50-75% Grass cover, Fair, HSG C
78,239	84	50-75% Grass cover, Fair, HSG D
142,893	30	Woods, Good, HSG A
81,209	70	Woods, Good, HSG C
173,668	77	Woods, Good, HSG D
836,116	75	Weighted Average
531,611		63.58% Pervious Area
304,505		36.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.0950	0.15		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.5	143	0.1000	1.58		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
21.3	535	0.0070	0.42		Shallow Concentrated Flow, C -D
					Woodland Kv= 5.0 fps
39.2	828	Total			

Summary for Subcatchment S3.1: SUB 3.1

Runoff = 5.92 cfs @ 12.07 hrs, Volume= 19,781 cf, Depth= 5.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

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Type III 24-hr 25-Yr Rainfall=6.20"

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Area (sf)	CN	Description
36,951	98	Paved parking & roofs
3,700	79	50-75% Grass cover, Fair, HSG C
800	84	50-75% Grass cover, Fair, HSG D
41,451	96	Weighted Average
4,500		10.86% Pervious Area
36,951		89.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	160	0.0100	1.11		Sheet Flow, A - B
					Smooth surfaces n= 0.011 P2= 3.00"
2.6					Direct Entry, Min Tc
5.0	160	Total			

Summary for Subcatchment S3.2: SUB 3.2

Runoff = 0.98 cfs @ 12.07 hrs, Volume= 2,956 cf, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
798	98	Paved parking & roofs
7,924	79	50-75% Grass cover, Fair, HSG C
8,722	81	Weighted Average
7,924		90.85% Pervious Area
798		9.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	163	0.0220	1.04		Shallow Concentrated Flow, A - B
					Short Grass Pasture Kv= 7.0 fps
2.4					Direct Entry,
5.0	163	Total			

Summary for Subcatchment S3.3: SUB 3.3

Runoff = 0.17 cfs @ 12.07 hrs, Volume= 523 cf, Depth= 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
460	98	Paved parking & roofs
1,212	70	Woods, Good, HSG C
1,672	78	Weighted Average
1,212		72.49% Pervious Area
460		27.51% Impervious Area

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Type III 24-hr 25-Yr Rainfall=6.20"

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

Summary for Subcatchment S4: SUB 4

Runoff = 49.08 cfs @ 12.63 hrs, Volume= 333,877 cf, Depth= 3.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
188,582	98	Paved parking & roofs
20,781	79	50-75% Grass cover, Fair, HSG C
11,998	84	50-75% Grass cover, Fair, HSG D
419,188	73	Woods, Fair, HSG C
370,638	79	Woods, Fair, HSG D
1,011,187	80	Weighted Average
822,605		81.35% Pervious Area
188,582		18.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.3	100	0.0100	0.06		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.9	284	0.0600	1.22		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
10.4	341	0.0120	0.55		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
2.6	874	0.0140	5.64	281.88	Channel Flow, D - E
					Area= 50.0 sf Perim= 53.0' r= 0.94'
					n= 0.030 Earth, grassed & winding
46.2	1,599	Total			

Summary for Subcatchment S4.1: SUB 4.1

Runoff = 5.28 cfs @ 12.07 hrs, Volume= 17,879 cf, Depth= 5.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
35,058	98	Paved parking & roofs
1,656	74	>75% Grass cover, Good, HSG C
36,714	97	Weighted Average
1,656		4.51% Pervious Area
35,058		95.49% Impervious Area

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Type III 24-hr 25-Yr Rainfall=6.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	200	0.0100	1.16		Sheet Flow, A - B Smooth surfaces n= 0.011 P2= 3.00"
0.7	81	0.0100	2.03		Shallow Concentrated Flow, B - C Paved Kv= 20.3 fps
1.4					Direct Entry, Min Tc
5.0	281	Total			

Summary for Subcatchment S6: SUB 6

Runoff = 11.37 cfs @ 12.18 hrs, Volume= 44,961 cf, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
10,824	98	Paved parking & roofs
19,401	79	50-75% Grass cover, Fair, HSG C
64,092	84	50-75% Grass cover, Fair, HSG D
32,603	70	Woods, Good, HSG C
5,760	77	Woods, Good, HSG D
132,680	81	Weighted Average
121,856		91.84% Pervious Area
10,824		8.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	40	0.0410	0.08		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	71	0.1120	1.67		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
4.5	265	0.0380	0.97		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
0.3	240	0.0250	11.44	686.23	Channel Flow, C - D Area= 60.0 sf Perim= 34.0' r= 1.76' n= 0.030 Earth, grassed & winding
13.5	616	Total			

Summary for Subcatchment S7: SUB 3

Runoff = 18.60 cfs @ 12.14 hrs, Volume= 68,622 cf, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

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Type III 24-hr 25-Yr Rainfall=6.20"

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Area (sf)	CN	Description
72,236	98	Paved parking & roofs
66,092	84	50-75% Grass cover, Fair, HSG D
5,176	73	Woods, Fair, HSG C
23,549	79	Woods, Fair, HSG D
167,053	89	Weighted Average
94,817		56.76% Pervious Area
72,236		43.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	58	0.0430	0.20		Sheet Flow, A - B Grass: Short n= 0.150 P2= 3.00"
1.1	136	0.0840	2.03		Shallow Concentrated Flow, B - C Short Grass Pasture Kv= 7.0 fps
2.8	424	0.0150	2.49		Shallow Concentrated Flow, C - D Paved Kv= 20.3 fps
0.1	39	0.0450	9.55	3.33	Pipe Channel, D - E 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
0.3	185	0.0380	11.66	116.60	Channel Flow, E - F Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.5	137	0.0168	4.82	0.95	Pipe Channel, F - G 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
0.4	102	0.0042	4.67	14.66	Pipe Channel, G - H 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
10.0	1,081	Total			

Summary for Subcatchment S8: SUB 8

Runoff = 5.45 cfs @ 12.29 hrs, Volume= 25,620 cf, Depth= 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Yr Rainfall=6.20"

Area (sf)	CN	Description
4,122	98	Paved parking & roofs
439	79	50-75% Grass cover, Fair, HSG C
34,658	74	>75% Grass cover, Good, HSG C
4,166	73	Woods, Fair, HSG C
38,464	79	Woods, Fair, HSG D
81,849	78	Weighted Average
77,727		94.96% Pervious Area
4,122		5.04% Impervious Area

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Type III 24-hr 25-Yr Rainfall=6.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	120	0.0500	0.11		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
1.4	138	0.1100	1.66		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
1.9	141	0.0320	1.25		Shallow Concentrated Flow, C - D Short Grass Pasture Kv= 7.0 fps
21.1	399	Total			

Summary for Reach R1: REACH 1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 2.96" for 25-Yr event
 Inflow = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf
 Outflow = 14.59 cfs @ 13.42 hrs, Volume= 362,621 cf, Atten= 0%, Lag= 7.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.59 fps, Min. Travel Time= 4.0 min
 Avg. Velocity= 0.59 fps, Avg. Travel Time= 10.9 min

Peak Storage= 3,536 cf @ 13.35 hrs
 Average Depth at Peak Storage= 0.27'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 256.49 cfs

100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
 Length= 386.0' Slope= 0.0104 '/'
 Inlet Invert= 30.00', Outlet Invert= 26.00'

**Summary for Reach R2: REACH 2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 3.65" for 25-Yr event
 Inflow = 18.37 cfs @ 13.45 hrs, Volume= 278,064 cf
 Outflow = 18.35 cfs @ 13.60 hrs, Volume= 278,063 cf, Atten= 0%, Lag= 9.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.69 fps, Min. Travel Time= 5.2 min
 Avg. Velocity= 0.51 fps, Avg. Travel Time= 17.1 min

Peak Storage= 5,722 cf @ 13.51 hrs
 Average Depth at Peak Storage= 0.30'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 252.44 cfs

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100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 527.0' Slope= 0.0100 '/'
Inlet Invert= 31.29', Outlet Invert= 26.00'



Summary for Reach R3: REACH 3

Inflow Area = 2,380,909 sf, 3.30% Impervious, Inflow Depth = 3.23" for 25-Yr event
Inflow = 32.93 cfs @ 13.57 hrs, Volume= 640,684 cf
Outflow = 32.92 cfs @ 13.66 hrs, Volume= 640,681 cf, Atten= 0%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.63 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 10.0 min

Peak Storage= 6,222 cf @ 13.61 hrs
Average Depth at Peak Storage= 0.91'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 141.56 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 874.0' Slope= 0.0138 '/'
Inlet Invert= 26.00', Outlet Invert= 13.90'



Summary for Reach R3.1: REACH 3.1

Inflow Area = 51,845 sf, 73.70% Impervious, Inflow Depth = 5.38" for 25-Yr event
Inflow = 2.89 cfs @ 12.27 hrs, Volume= 23,260 cf
Outflow = 2.70 cfs @ 12.38 hrs, Volume= 23,260 cf, Atten= 7%, Lag= 7.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.76 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 8.5 min

Peak Storage= 638 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 833.80 cfs

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Type III 24-hr 25-Yr Rainfall=6.20"

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50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 179.0' Slope= 0.0056 '/'
Inlet Invert= 24.90', Outlet Invert= 23.90'



Summary for Reach R3.2: REACH 3.2

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 4.02" for 25-Yr event
Inflow = 1.16 cfs @ 12.07 hrs, Volume= 3,479 cf
Outflow = 1.13 cfs @ 12.12 hrs, Volume= 3,479 cf, Atten= 3%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.84 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 2.3 min

Peak Storage= 123 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 1,651.08 cfs

50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 91.3' Slope= 0.0219 '/'
Inlet Invert= 26.90', Outlet Invert= 24.90'



Summary for Reach R4: REACH 4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 3.78" for 25-Yr event
Inflow = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf
Outflow = 48.14 cfs @ 12.58 hrs, Volume= 358,096 cf, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.59 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.79 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1,241 cf @ 12.57 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 157.25 cfs

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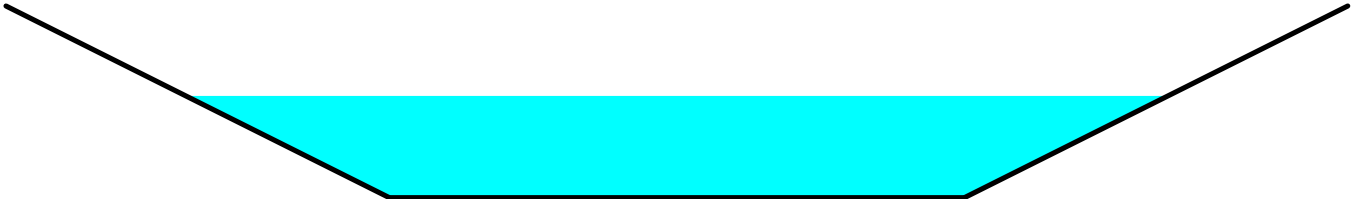
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6.00' x 2.00' deep channel, $n = 0.030$ Stream, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 14.00'

Length= 144.0' Slope= 0.0171 ' '

Inlet Invert= 16.36', Outlet Invert= 13.90'



Summary for Reach R4.1: REACH 4.1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 5.84" for 25-Yr event

Inflow = 3.99 cfs @ 12.13 hrs, Volume= 17,880 cf

Outflow = 3.05 cfs @ 12.30 hrs, Volume= 17,880 cf, Atten= 24%, Lag= 9.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 1.57 fps, Min. Travel Time= 5.8 min

Avg. Velocity = 0.53 fps, Avg. Travel Time= 17.3 min

Peak Storage= 1,072 cf @ 12.20 hrs

Average Depth at Peak Storage= 0.15'

Bank-Full Depth= 2.00' Flow Area= 56.0 sf, Capacity= 390.71 cfs

12.00' x 2.00' deep channel, $n = 0.030$ Earth, grassed & winding

Side Slope Z-value= 8.0 ' ' Top Width= 44.00'

Length= 552.0' Slope= 0.0145 ' '

Inlet Invert= 22.00', Outlet Invert= 14.00'



Summary for Reach R5: REACH 5

Inflow Area = 4,565,673 sf, 15.80% Impervious, Inflow Depth = 3.55" for 25-Yr event

Inflow = 119.28 cfs @ 12.63 hrs, Volume= 1,350,533 cf

Outflow = 119.24 cfs @ 12.65 hrs, Volume= 1,350,532 cf, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 7.72 fps, Min. Travel Time= 0.7 min

Avg. Velocity = 1.92 fps, Avg. Travel Time= 2.8 min

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Peak Storage= 4,899 cf @ 12.64 hrs

Average Depth at Peak Storage= 1.80'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 147.04 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 13.00'

Length= 317.0' Slope= 0.0134 ' '

Inlet Invert= 13.90', Outlet Invert= 9.64'



Summary for Reach R6: REACH 6

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 3.58" for 25-Yr event

Inflow = 43.76 cfs @ 12.55 hrs, Volume= 289,481 cf

Outflow = 43.76 cfs @ 12.56 hrs, Volume= 289,481 cf, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 5.82 fps, Min. Travel Time= 0.4 min

Avg. Velocity = 1.67 fps, Avg. Travel Time= 1.3 min

Peak Storage= 999 cf @ 12.56 hrs

Average Depth at Peak Storage= 0.42'

Bank-Full Depth= 2.00' Flow Area= 42.0 sf, Capacity= 623.19 cfs

17.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 2.0 ' ' Top Width= 25.00'

Length= 133.0' Slope= 0.0328 ' '

Inlet Invert= 23.90', Outlet Invert= 19.54'



Summary for Pond AP3: 4 - 24"CMP

Inflow Area = 4,698,353 sf, 15.58% Impervious, Inflow Depth = 3.56" for 25-Yr event

Inflow = 122.25 cfs @ 12.64 hrs, Volume= 1,395,494 cf

Outflow = 99.77 cfs @ 13.01 hrs, Volume= 1,395,479 cf, Atten= 18%, Lag= 22.7 min

Primary = 99.77 cfs @ 13.01 hrs, Volume= 1,395,479 cf

Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 6

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Peak Elev= 15.68' @ 13.01 hrs Surf.Area= 34,906 sf Storage= 63,328 cf

Plug-Flow detention time= 4.1 min calculated for 1,395,479 cf (100% of inflow)

Center-of-Mass det. time= 4.0 min (904.9 - 900.8)

Volume	Invert	Avail.Storage	Storage Description
#1	9.64'	96,037 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.64	0	0	0
10.00	856	154	154
12.00	4,037	4,893	5,047
14.00	13,588	17,625	22,672
16.00	39,016	52,604	75,276
16.50	44,026	20,761	96,037

Device	Routing	Invert	Outlet Devices
#1	Primary	9.77'	24.0" Round Proposed 3 - 24" CMP X 3.00 L= 65.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.12' S= 0.0100 ' / Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Primary	9.83'	24.0" Round Existing 24" CMP L= 64.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.83' S= -0.0009 ' / Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#3	Secondary	16.50'	20.0' long x 25.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=99.77 cfs @ 13.01 hrs HW=15.68' (Free Discharge)↑ **1=Proposed 3 - 24" CMP** (Barrel Controls 76.14 cfs @ 8.08 fps)↑ **2=Existing 24" CMP** (Barrel Controls 23.62 cfs @ 7.52 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=9.64' (Free Discharge)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond C3: CULV-3**

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 2.96" for 25-Yr event
 Inflow = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf
 Outflow = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf, Atten= 0%, Lag= 0.0 min
 Primary = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.42' @ 13.30 hrs

Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.60'	24.0" Round Culvert L= 169.0' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 31.60' / 30.00' S= 0.0095 ' /' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 3.14 sf

Primary OutFlow Max=14.59 cfs @ 13.30 hrs HW=33.42' TW=31.60' (Fixed TW Elev= 31.60')

↑**1=Culvert** (Outlet Controls 14.59 cfs @ 6.37 fps)

Summary for Pond C4: CULV-4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 3.78" for 25-Yr event
 Inflow = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf
 Outflow = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf, Atten= 0%, Lag= 0.0 min
 Primary = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 25.56' @ 12.56 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.79'	24.0" Round Culvert L= 86.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 16.79' / 16.36' S= 0.0050 ' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=48.19 cfs @ 12.56 hrs HW=25.55' (Free Discharge)

↑**1=Culvert** (Barrel Controls 48.19 cfs @ 15.34 fps)

Summary for Pond C7: CULV-7

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 3.58" for 25-Yr event
 Inflow = 43.76 cfs @ 12.56 hrs, Volume= 289,481 cf
 Outflow = 43.72 cfs @ 12.58 hrs, Volume= 289,474 cf, Atten= 0%, Lag= 0.8 min
 Primary = 32.92 cfs @ 12.58 hrs, Volume= 280,765 cf
 Secondary = 10.80 cfs @ 12.58 hrs, Volume= 8,708 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 23.47' @ 12.58 hrs Surf.Area= 7,070 sf Storage= 9,483 cf

Plug-Flow detention time= 1.7 min calculated for 289,474 cf (100% of inflow)
 Center-of-Mass det. time= 1.6 min (859.9 - 858.3)

Volume	Invert	Avail.Storage	Storage Description
#1	19.54'	9,728 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.54	0	0	0
20.00	144	33	33
21.00	890	517	550
22.00	2,015	1,453	2,003
23.00	6,588	4,302	6,304
23.50	7,106	3,424	9,728

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Device	Routing	Invert	Outlet Devices
#1	Primary	19.54'	24.0" Round 24" RCP L= 184.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 19.54' / 16.79' S= 0.0149 ' S= 0.0149 ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	23.40'	250.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=32.92 cfs @ 12.58 hrs HW=23.47' (Free Discharge)

↑1=24" RCP (Barrel Controls 32.92 cfs @ 10.48 fps)

Secondary OutFlow Max=10.64 cfs @ 12.58 hrs HW=23.47' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 10.64 cfs @ 0.65 fps)

Summary for Pond CB5: CB-5

Inflow Area = 1,672 sf, 27.51% Impervious, Inflow Depth = 3.76" for 25-Yr event
 Inflow = 0.17 cfs @ 12.07 hrs, Volume= 523 cf
 Outflow = 0.17 cfs @ 12.07 hrs, Volume= 523 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 12.07 hrs, Volume= 523 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 629.89' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	29.50'	1.0" Round 12" CULV L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.50' / 29.15' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.01 sf

Primary OutFlow Max=0.17 cfs @ 12.07 hrs HW=627.27' (Free Discharge)

↑1=12" CULV (Barrel Controls 0.17 cfs @ 32.00 fps)

Summary for Pond CB6: CB-6

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 4.02" for 25-Yr event
 Inflow = 1.16 cfs @ 12.07 hrs, Volume= 3,479 cf
 Outflow = 1.16 cfs @ 12.07 hrs, Volume= 3,479 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.16 cfs @ 12.07 hrs, Volume= 3,479 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 28.46' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.82'	12.0" Round 12"SD L= 184.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 27.82' / 26.90' S= 0.0050 ' S= 0.0050 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 0.79 sf

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Primary OutFlow Max=1.15 cfs @ 12.07 hrs HW=28.46' (Free Discharge)

↑1=12"SD (Barrel Controls 1.15 cfs @ 3.11 fps)

Summary for Pond DMH-1: DMH-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 5.84" for 25-Yr event
 Inflow = 5.28 cfs @ 12.07 hrs, Volume= 17,879 cf
 Outflow = 5.28 cfs @ 12.07 hrs, Volume= 17,879 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.28 cfs @ 12.07 hrs, Volume= 17,879 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.68' @ 12.07 hrs

Flood Elev= 36.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.58'	24.0" Round 24" SD to Detention Bed L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 32.58' / 32.35' S= 0.0077 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=5.28 cfs @ 12.07 hrs HW=33.68' (Free Discharge)

↑1=24" SD to Detention Bed (Barrel Controls 5.28 cfs @ 4.30 fps)

Summary for Pond DMH-6: DMH-6

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 5.73" for 25-Yr event
 Inflow = 5.92 cfs @ 12.07 hrs, Volume= 19,781 cf
 Outflow = 5.92 cfs @ 12.07 hrs, Volume= 19,781 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.92 cfs @ 12.07 hrs, Volume= 19,781 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 31.19' @ 12.07 hrs

Flood Elev= 32.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	30.13'	24.0" Round 24" SD to Detention Bed L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 30.13' / 28.90' S= 0.2050 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=5.92 cfs @ 12.07 hrs HW=31.19' (Free Discharge)

↑1=24" SD to Detention Bed (Inlet Controls 5.92 cfs @ 3.50 fps)

Summary for Pond OC1: OFFSITE CULV-1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 2.96" for 25-Yr event
 Inflow = 66.68 cfs @ 12.41 hrs, Volume= 362,632 cf
 Outflow = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf, Atten= 78%, Lag= 53.2 min
 Primary = 14.59 cfs @ 13.30 hrs, Volume= 362,623 cf

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Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 36.95' @ 13.30 hrs Surf.Area= 100,691 sf Storage= 143,927 cf

Plug-Flow detention time= 116.1 min calculated for 362,623 cf (100% of inflow)

Center-of-Mass det. time= 116.1 min (974.1 - 858.0)

Volume	Invert	Avail.Storage	Storage Description
#1	34.25'	602,689 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.25	5,289	0	0
36.00	67,698	63,864	63,864
38.00	137,090	204,788	268,652
40.00	196,947	334,037	602,689

Device	Routing	Invert	Outlet Devices
#1	Primary	34.25'	18.0" Round 18" RCP L= 97.6' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 34.25' / 32.29' S= 0.0201 ' S= 0.0201 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=14.59 cfs @ 13.30 hrs HW=36.95' (Free Discharge)↑**1=18" RCP** (Barrel Controls 14.59 cfs @ 8.26 fps)**Summary for Pond OC2: OFFSITE CULV-2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 3.65" for 25-Yr event
 Inflow = 35.70 cfs @ 12.80 hrs, Volume= 278,070 cf
 Outflow = 18.37 cfs @ 13.45 hrs, Volume= 278,064 cf, Atten= 49%, Lag= 39.0 min
 Primary = 18.37 cfs @ 13.45 hrs, Volume= 278,064 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 37.67' @ 13.45 hrs Surf.Area= 27,561 sf Storage= 62,087 cf

Plug-Flow detention time= 37.3 min calculated for 278,064 cf (100% of inflow)

Center-of-Mass det. time= 37.3 min (906.4 - 869.1)

Volume	Invert	Avail.Storage	Storage Description
#1	32.88'	71,548 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.88	5,285	0	0
34.00	8,520	7,731	7,731
36.00	12,392	20,912	28,643
38.00	30,513	42,905	71,548

Device	Routing	Invert	Outlet Devices
#1	Primary	32.88'	18.0" Round 18" RCP L= 93.6' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 32.88' / 31.29' S= 0.0170 ' / ' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=18.37 cfs @ 13.45 hrs HW=37.67' (Free Discharge)

Summary for Pond P3.1: STORMTECH DETENTION / OCS-2

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 5.73" for 25-Yr event
 Inflow = 5.92 cfs @ 12.07 hrs, Volume= 19,781 cf
 Outflow = 2.30 cfs @ 12.27 hrs, Volume= 19,781 cf, Atten= 61%, Lag= 12.2 min
 Primary = 2.30 cfs @ 12.27 hrs, Volume= 19,781 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 31.08' @ 12.27 hrs Surf.Area= 3,328 sf Storage= 7,136 cf
 Flood Elev= 31.21' Surf.Area= 3,328 sf Storage= 7,258 cf

Plug-Flow detention time= 129.2 min calculated for 19,781 cf (100% of inflow)
 Center-of-Mass det. time= 129.2 min (885.7 - 756.6)

Volume	Invert	Avail.Storage	Storage Description
#1	27.67'	2,926 cf	34.70'W x 95.90'L x 3.50'H Prismatic 11,647 cf Overall - 4,331 cf Embedded = 7,316 cf x 40.0% Voids
#2	28.17'	4,331 cf	ADS_StormTech SC-740 @ 95.90' L x 7 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 95.90'L = 618.8 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		7,258 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	25.15'	24.0" Round 24" SD L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 25.15' / 25.00' S= 0.0100 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	25.15'	2.0" Vert. 2" Orifice C= 0.600
#3	Device 1	29.12'	4.0" Vert. 4" Orifice C= 0.600
#4	Device 1	30.90'	6.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=2.30 cfs @ 12.27 hrs HW=31.08' (Free Discharge)

Summary for Pond P4.1: STORMTECH DETENTION / OCS-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 5.84" for 25-Yr event
 Inflow = 5.28 cfs @ 12.07 hrs, Volume= 17,879 cf
 Outflow = 3.99 cfs @ 12.13 hrs, Volume= 17,880 cf, Atten= 24%, Lag= 3.8 min
 Primary = 3.99 cfs @ 12.13 hrs, Volume= 17,880 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

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Peak Elev= 33.95' @ 12.13 hrs Surf.Area= 1,702 sf Storage= 2,637 cf
 Flood Elev= 34.78' Surf.Area= 1,702 sf Storage= 3,388 cf

Plug-Flow detention time= 9.3 min calculated for 17,876 cf (100% of inflow)
 Center-of-Mass det. time= 9.3 min (759.9 - 750.6)

Volume	Invert	Avail.Storage	Storage Description
#1	31.72'	1,513 cf	25.25'W x 67.40'L x 3.50'H Prismatic 5,956 cf Overall - 2,174 cf Embedded = 3,782 cf x 40.0% Voids
#2	32.22'	2,174 cf	ADS_StormTech SC-740 @ 67.40' L x 5 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 67.40'L = 434.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		3,687 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	28.76'	24.0" Round 24" SD L= 268.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 28.76' / 22.00' S= 0.0252 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	28.76'	4.0" Vert. 4" Orifice C= 0.600
#3	Device 1	32.90'	6.0" Vert. 6" Orifice C= 0.600
#4	Device 1	33.65'	4.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=3.98 cfs @ 12.13 hrs HW=33.95' (Free Discharge)

- 1=24" SD (Passes 3.98 cfs of 24.45 cfs potential flow)
- 2=4" Orifice (Orifice Controls 0.94 cfs @ 10.80 fps)
- 3=6" Orifice (Orifice Controls 0.85 cfs @ 4.32 fps)
- 4=Sharp-Crested Vee/Trap Weir (Weir Controls 2.19 cfs @ 1.80 fps)

Summary for Pond W: WETLAND

Inflow Area = 917,965 sf, 33.62% Impervious, Inflow Depth = 3.48" for 25-Yr event
 Inflow = 42.30 cfs @ 12.50 hrs, Volume= 266,221 cf
 Outflow = 41.85 cfs @ 12.57 hrs, Volume= 266,221 cf, Atten= 1%, Lag= 3.7 min
 Primary = 41.85 cfs @ 12.57 hrs, Volume= 266,221 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 24.68' @ 12.57 hrs Surf.Area= 14,582 sf Storage= 5,150 cf

Plug-Flow detention time= 1.1 min calculated for 266,166 cf (100% of inflow)
 Center-of-Mass det. time= 1.1 min (854.6 - 853.4)

Volume	Invert	Avail.Storage	Storage Description
#1	23.90'	42,267 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.90	0	0	0
24.00	412	21	21
26.00	41,834	42,246	42,267

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Device	Routing	Invert	Outlet Devices
#1	Primary	23.90'	152.0 deg x 17.0' long Sharp-Crested Vee/Trap Weir Cv= 2.47 (C= 3.09)

Primary OutFlow Max=41.84 cfs @ 12.57 hrs HW=24.68' (Free Discharge)

↑1=Sharp-Crested Vee/Trap Weir (Weir Controls 41.84 cfs @ 2.65 fps)

Summary for Link AP1: AP 1

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 3.78" for 25-Yr event
Inflow = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf
Primary = 48.21 cfs @ 12.56 hrs, Volume= 358,096 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP2: AP 2

Inflow Area = 4,698,353 sf, 15.58% Impervious, Inflow Depth = 3.56" for 25-Yr event
Inflow = 99.77 cfs @ 13.01 hrs, Volume= 1,395,479 cf
Primary = 99.77 cfs @ 13.01 hrs, Volume= 1,395,479 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment OS1: OFFSITE SUB 1 Runoff Area=1,467,784 sf 3.67% Impervious Runoff Depth=3.87"
Flow Length=1,645' Tc=29.1 min CN=70 Runoff=87.48 cfs 473,256 cf

Subcatchment OS2: OFFSITE SUB 2 Runoff Area=913,125 sf 2.70% Impervious Runoff Depth=4.64"
Flow Length=1,654' Tc=58.8 min CN=77 Runoff=45.22 cfs 352,800 cf

Subcatchment S3: SUB 3 Runoff Area=836,116 sf 36.42% Impervious Runoff Depth=4.41"
Flow Length=828' Tc=39.2 min CN=75 Runoff=49.36 cfs 307,609 cf

Subcatchment S3.1: SUB 3.1 Runoff Area=41,451 sf 89.14% Impervious Runoff Depth=6.82"
Flow Length=160' Slope=0.0100 '/' Tc=5.0 min CN=96 Runoff=7.00 cfs 23,567 cf

Subcatchment S3.2: SUB 3.2 Runoff Area=8,722 sf 9.15% Impervious Runoff Depth=5.08"
Flow Length=163' Slope=0.0220 '/' Tc=5.0 min CN=81 Runoff=1.22 cfs 3,696 cf

Subcatchment S3.3: SUB 3.3 Runoff Area=1,672 sf 27.51% Impervious Runoff Depth=4.75"
Tc=5.0 min CN=78 Runoff=0.22 cfs 662 cf

Subcatchment S4: SUB 4 Runoff Area=1,011,187 sf 18.65% Impervious Runoff Depth=4.97"
Flow Length=1,599' Tc=46.2 min CN=80 Runoff=61.31 cfs 418,972 cf

Subcatchment S4.1: SUB 4.1 Runoff Area=36,714 sf 95.49% Impervious Runoff Depth=6.94"
Flow Length=281' Slope=0.0100 '/' Tc=5.0 min CN=97 Runoff=6.23 cfs 21,238 cf

Subcatchment S6: SUB 6 Runoff Area=132,680 sf 8.16% Impervious Runoff Depth=5.08"
Flow Length=616' Tc=13.5 min CN=81 Runoff=14.13 cfs 56,221 cf

Subcatchment S7: SUB 3 Runoff Area=167,053 sf 43.24% Impervious Runoff Depth=6.00"
Flow Length=1,081' Tc=10.0 min CN=89 Runoff=22.41 cfs 83,543 cf

Subcatchment S8: SUB 8 Runoff Area=81,849 sf 5.04% Impervious Runoff Depth=4.75"
Flow Length=399' Tc=21.1 min CN=78 Runoff=6.87 cfs 32,384 cf

Reach R1: REACH 1 Avg. Flow Depth=0.28' Max Vel=1.63 fps Inflow=15.78 cfs 473,246 cf
n=0.030 L=386.0' S=0.0104 '/' Capacity=256.49 cfs Outflow=15.78 cfs 473,244 cf

Reach R2: REACH 2 Avg. Flow Depth=0.40' Max Vel=2.07 fps Inflow=45.49 cfs 352,800 cf
n=0.030 L=527.0' S=0.0100 '/' Capacity=252.44 cfs Outflow=35.27 cfs 352,800 cf

Reach R3: REACH 3 Avg. Flow Depth=1.15' Max Vel=5.26 fps Inflow=50.95 cfs 826,044 cf
n=0.030 L=874.0' S=0.0138 '/' Capacity=141.56 cfs Outflow=50.29 cfs 826,043 cf

Reach R3.1: REACH 3.1 Avg. Flow Depth=0.10' Max Vel=0.94 fps Inflow=6.73 cfs 27,763 cf
n=0.025 L=179.0' S=0.0056 '/' Capacity=833.80 cfs Outflow=4.81 cfs 27,763 cf

Reach R3.2: REACH 3.2 Avg. Flow Depth=0.03' Max Vel=0.91 fps Inflow=1.44 cfs 4,357 cf
n=0.025 L=91.3' S=0.0219 '/' Capacity=1,651.08 cfs Outflow=1.40 cfs 4,357 cf

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Type III 24-hr 50-Yr Rainfall=7.30"

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Reach R4: REACH 4	Avg. Flow Depth=1.22' Max Vel=6.02 fps Inflow=61.80 cfs 451,402 cf n=0.030 L=144.0' S=0.0171 '/' Capacity=157.25 cfs Outflow=61.80 cfs 451,402 cf
Reach R4.1: REACH 4.1	Avg. Flow Depth=0.18' Max Vel=1.77 fps Inflow=5.53 cfs 21,238 cf n=0.030 L=552.0' S=0.0145 '/' Capacity=390.71 cfs Outflow=4.29 cfs 21,238 cf
Reach R5: REACH 5	Avg. Flow Depth=2.01' Max Vel=8.19 fps Inflow=148.14 cfs 1,717,655 cf n=0.025 L=317.0' S=0.0134 '/' Capacity=147.04 cfs Outflow=148.12 cfs 1,717,655 cf
Reach R6: REACH 6	Avg. Flow Depth=0.49' Max Vel=6.37 fps Inflow=55.52 cfs 367,756 cf n=0.025 L=133.0' S=0.0328 '/' Capacity=623.19 cfs Outflow=55.51 cfs 367,756 cf
Pond AP3: 4 - 24"CMP	Peak Elev=17.03' Storage=96,037 cf Inflow=152.35 cfs 1,773,875 cf Primary=114.14 cfs 1,756,365 cf Secondary=19.53 cfs 6,068 cf Outflow=133.67 cfs 1,762,434 cf
Pond C3: CULV-3	Peak Elev=33.51' Inflow=15.78 cfs 473,246 cf 24.0" Round Culvert n=0.013 L=169.0' S=0.0095 '/' Outflow=15.78 cfs 473,246 cf
Pond C4: CULV-4	Peak Elev=30.18' Inflow=61.80 cfs 451,402 cf 24.0" Round Culvert n=0.011 L=86.0' S=0.0050 '/' Outflow=61.80 cfs 451,402 cf
Pond C7: CULV-7	Peak Elev=23.51' Storage=9,728 cf Inflow=55.51 cfs 367,756 cf Primary=33.07 cfs 335,031 cf Secondary=22.56 cfs 32,828 cf Outflow=55.63 cfs 367,860 cf
Pond CB5: CB-5	Peak Elev=979.45' Inflow=0.22 cfs 662 cf 1.0" Round Culvert n=0.010 L=70.0' S=0.0050 '/' Outflow=0.22 cfs 662 cf
Pond CB6: CB-6	Peak Elev=28.55' Inflow=1.44 cfs 4,357 cf 12.0" Round Culvert n=0.013 L=184.0' S=0.0050 '/' Outflow=1.44 cfs 4,357 cf
Pond DMH-1: DMH-1	Peak Elev=33.80' Inflow=6.23 cfs 21,238 cf 24.0" Round Culvert n=0.010 L=30.0' S=0.0077 '/' Outflow=6.23 cfs 21,238 cf
Pond DMH-6: DMH-6	Peak Elev=31.30' Inflow=7.00 cfs 23,567 cf 24.0" Round Culvert n=0.010 L=6.0' S=0.2050 '/' Outflow=7.00 cfs 23,567 cf
Pond OC1: OFFSITE CULV-1	Peak Elev=37.48' Storage=202,628 cf Inflow=87.48 cfs 473,256 cf 18.0" Round Culvert n=0.013 L=97.6' S=0.0201 '/' Outflow=15.78 cfs 473,246 cf
Pond OC2: OFFSITE CULV-2	Peak Elev=62.75' Storage=71,548 cf Inflow=45.22 cfs 352,800 cf 18.0" Round Culvert n=0.013 L=93.6' S=0.0170 '/' Outflow=45.49 cfs 352,800 cf
Pond P3.1: STORMTECH DETENTION /	Peak Elev=31.27' Storage=7,258 cf Inflow=7.00 cfs 23,567 cf Outflow=5.33 cfs 23,406 cf
Pond P4.1: STORMTECH DETENTION /	Peak Elev=34.08' Storage=2,775 cf Inflow=6.23 cfs 21,238 cf Outflow=5.53 cfs 21,238 cf
Pond W: WETLAND	Peak Elev=24.81' Storage=7,143 cf Inflow=54.03 cfs 339,993 cf Outflow=53.36 cfs 339,993 cf

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Type III 24-hr 50-Yr Rainfall=7.30"

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Link AP1: AP 1

Inflow=61.80 cfs 451,402 cf

Primary=61.80 cfs 451,402 cf

Link AP2: AP 2

Inflow=133.67 cfs 1,762,434 cf

Primary=133.67 cfs 1,762,434 cf

Total Runoff Area = 4,698,353 sf Runoff Volume = 1,773,947 cf Average Runoff Depth = 4.53"
84.42% Pervious = 3,966,350 sf 15.58% Impervious = 732,003 sf

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Type III 24-hr 50-Yr Rainfall=7.30"

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Summary for Subcatchment OS1: OFFSITE SUB 1

Runoff = 87.48 cfs @ 12.41 hrs, Volume= 473,256 cf, Depth= 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
53,844	98	Paved parking & roofs
32,748	49	50-75% Grass cover, Fair, HSG A
12,803	79	50-75% Grass cover, Fair, HSG C
12,554	84	50-75% Grass cover, Fair, HSG D
205,440	30	Woods, Good, HSG A
228,765	70	Woods, Good, HSG C
921,630	77	Woods, Good, HSG D
1,467,784	70	Weighted Average
1,413,940		96.33% Pervious Area
53,844		3.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0430	0.25		Sheet Flow, A - B
					Range n= 0.130 P2= 3.00"
0.8	75	0.0510	1.58		Shallow Concentrated Flow, B -C
					Short Grass Pasture Kv= 7.0 fps
20.3	923	0.0230	0.76		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
1.4	547	0.0180	6.31	157.83	Channel Flow, D - E
					Area= 25.0 sf Perim= 27.0' r= 0.93'
					n= 0.030 Earth, grassed & winding
29.1	1,645	Total			

Summary for Subcatchment OS2: OFFSITE SUB 2

Runoff = 45.22 cfs @ 12.80 hrs, Volume= 352,800 cf, Depth= 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
24,623	98	Paved parking & roofs
8,226	79	50-75% Grass cover, Fair, HSG C
13,667	84	50-75% Grass cover, Fair, HSG D
151,095	70	Woods, Good, HSG C
715,514	77	Woods, Good, HSG D
913,125	77	Weighted Average
888,502		97.30% Pervious Area
24,623		2.70% Impervious Area

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Type III 24-hr 50-Yr Rainfall=7.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0530	0.11		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
43.8	1,554	0.0140	0.59		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
58.8	1,654	Total			

Summary for Subcatchment S3: SUB 3

Runoff = 49.36 cfs @ 12.54 hrs, Volume= 307,609 cf, Depth= 4.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
304,505	98	Paved parking & roofs
45,477	49	50-75% Grass cover, Fair, HSG A
10,125	79	50-75% Grass cover, Fair, HSG C
78,239	84	50-75% Grass cover, Fair, HSG D
142,893	30	Woods, Good, HSG A
81,209	70	Woods, Good, HSG C
173,668	77	Woods, Good, HSG D
836,116	75	Weighted Average
531,611		63.58% Pervious Area
304,505		36.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	150	0.0950	0.15		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.5	143	0.1000	1.58		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
21.3	535	0.0070	0.42		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
39.2	828	Total			

Summary for Subcatchment S3.1: SUB 3.1

Runoff = 7.00 cfs @ 12.07 hrs, Volume= 23,567 cf, Depth= 6.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

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Type III 24-hr 50-Yr Rainfall=7.30"

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Area (sf)	CN	Description
36,951	98	Paved parking & roofs
3,700	79	50-75% Grass cover, Fair, HSG C
800	84	50-75% Grass cover, Fair, HSG D
41,451	96	Weighted Average
4,500		10.86% Pervious Area
36,951		89.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	160	0.0100	1.11		Sheet Flow, A - B
					Smooth surfaces n= 0.011 P2= 3.00"
2.6					Direct Entry, Min Tc
5.0	160	Total			

Summary for Subcatchment S3.2: SUB 3.2

Runoff = 1.22 cfs @ 12.07 hrs, Volume= 3,696 cf, Depth= 5.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
798	98	Paved parking & roofs
7,924	79	50-75% Grass cover, Fair, HSG C
8,722	81	Weighted Average
7,924		90.85% Pervious Area
798		9.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	163	0.0220	1.04		Shallow Concentrated Flow, A - B
					Short Grass Pasture Kv= 7.0 fps
2.4					Direct Entry,
5.0	163	Total			

Summary for Subcatchment S3.3: SUB 3.3

Runoff = 0.22 cfs @ 12.07 hrs, Volume= 662 cf, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
460	98	Paved parking & roofs
1,212	70	Woods, Good, HSG C
1,672	78	Weighted Average
1,212		72.49% Pervious Area
460		27.51% Impervious Area

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Type III 24-hr 50-Yr Rainfall=7.30"

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

Summary for Subcatchment S4: SUB 4

Runoff = 61.31 cfs @ 12.63 hrs, Volume= 418,972 cf, Depth= 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
188,582	98	Paved parking & roofs
20,781	79	50-75% Grass cover, Fair, HSG C
11,998	84	50-75% Grass cover, Fair, HSG D
419,188	73	Woods, Fair, HSG C
370,638	79	Woods, Fair, HSG D
1,011,187	80	Weighted Average
822,605		81.35% Pervious Area
188,582		18.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.3	100	0.0100	0.06		Sheet Flow, A - B
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.9	284	0.0600	1.22		Shallow Concentrated Flow, B - C
					Woodland Kv= 5.0 fps
10.4	341	0.0120	0.55		Shallow Concentrated Flow, C - D
					Woodland Kv= 5.0 fps
2.6	874	0.0140	5.64	281.88	Channel Flow, D - E
					Area= 50.0 sf Perim= 53.0' r= 0.94'
					n= 0.030 Earth, grassed & winding
46.2	1,599	Total			

Summary for Subcatchment S4.1: SUB 4.1

Runoff = 6.23 cfs @ 12.07 hrs, Volume= 21,238 cf, Depth= 6.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
35,058	98	Paved parking & roofs
1,656	74	>75% Grass cover, Good, HSG C
36,714	97	Weighted Average
1,656		4.51% Pervious Area
35,058		95.49% Impervious Area

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Type III 24-hr 50-Yr Rainfall=7.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	200	0.0100	1.16		Sheet Flow, A - B Smooth surfaces n= 0.011 P2= 3.00"
0.7	81	0.0100	2.03		Shallow Concentrated Flow, B - C Paved Kv= 20.3 fps
1.4					Direct Entry, Min Tc
5.0	281	Total			

Summary for Subcatchment S6: SUB 6

Runoff = 14.13 cfs @ 12.18 hrs, Volume= 56,221 cf, Depth= 5.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
10,824	98	Paved parking & roofs
19,401	79	50-75% Grass cover, Fair, HSG C
64,092	84	50-75% Grass cover, Fair, HSG D
32,603	70	Woods, Good, HSG C
5,760	77	Woods, Good, HSG D
132,680	81	Weighted Average
121,856		91.84% Pervious Area
10,824		8.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	40	0.0410	0.08		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	71	0.1120	1.67		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
4.5	265	0.0380	0.97		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
0.3	240	0.0250	11.44	686.23	Channel Flow, C - D Area= 60.0 sf Perim= 34.0' r= 1.76' n= 0.030 Earth, grassed & winding
13.5	616	Total			

Summary for Subcatchment S7: SUB 3

Runoff = 22.41 cfs @ 12.14 hrs, Volume= 83,543 cf, Depth= 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

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Type III 24-hr 50-Yr Rainfall=7.30"

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Area (sf)	CN	Description
72,236	98	Paved parking & roofs
66,092	84	50-75% Grass cover, Fair, HSG D
5,176	73	Woods, Fair, HSG C
23,549	79	Woods, Fair, HSG D
167,053	89	Weighted Average
94,817		56.76% Pervious Area
72,236		43.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	58	0.0430	0.20		Sheet Flow, A - B Grass: Short n= 0.150 P2= 3.00"
1.1	136	0.0840	2.03		Shallow Concentrated Flow, B - C Short Grass Pasture Kv= 7.0 fps
2.8	424	0.0150	2.49		Shallow Concentrated Flow, C - D Paved Kv= 20.3 fps
0.1	39	0.0450	9.55	3.33	Pipe Channel, D - E 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010 PVC, smooth interior
0.3	185	0.0380	11.66	116.60	Channel Flow, E - F Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.022 Earth, clean & straight
0.5	137	0.0168	4.82	0.95	Pipe Channel, F - G 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
0.4	102	0.0042	4.67	14.66	Pipe Channel, G - H 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
10.0	1,081	Total			

Summary for Subcatchment S8: SUB 8

Runoff = 6.87 cfs @ 12.29 hrs, Volume= 32,384 cf, Depth= 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Yr Rainfall=7.30"

Area (sf)	CN	Description
4,122	98	Paved parking & roofs
439	79	50-75% Grass cover, Fair, HSG C
34,658	74	>75% Grass cover, Good, HSG C
4,166	73	Woods, Fair, HSG C
38,464	79	Woods, Fair, HSG D
81,849	78	Weighted Average
77,727		94.96% Pervious Area
4,122		5.04% Impervious Area

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Type III 24-hr 50-Yr Rainfall=7.30"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	120	0.0500	0.11		Sheet Flow, A - B Woods: Light underbrush n= 0.400 P2= 3.00"
1.4	138	0.1100	1.66		Shallow Concentrated Flow, B - C Woodland Kv= 5.0 fps
1.9	141	0.0320	1.25		Shallow Concentrated Flow, C - D Short Grass Pasture Kv= 7.0 fps
21.1	399	Total			

Summary for Reach R1: REACH 1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 3.87" for 50-Yr event
 Inflow = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf
 Outflow = 15.78 cfs @ 13.57 hrs, Volume= 473,244 cf, Atten= 0%, Lag= 7.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.63 fps, Min. Travel Time= 3.9 min
 Avg. Velocity= 0.64 fps, Avg. Travel Time= 10.1 min

Peak Storage= 3,732 cf @ 13.50 hrs
 Average Depth at Peak Storage= 0.28'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 256.49 cfs

100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
 Length= 386.0' Slope= 0.0104 '/'
 Inlet Invert= 30.00', Outlet Invert= 26.00'

**Summary for Reach R2: REACH 2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 4.64" for 50-Yr event
 Inflow = 45.49 cfs @ 13.02 hrs, Volume= 352,800 cf
 Outflow = 35.27 cfs @ 13.20 hrs, Volume= 352,800 cf, Atten= 22%, Lag= 10.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 2.07 fps, Min. Travel Time= 4.2 min
 Avg. Velocity= 0.66 fps, Avg. Travel Time= 13.3 min

Peak Storage= 8,993 cf @ 13.13 hrs
 Average Depth at Peak Storage= 0.40'
 Bank-Full Depth= 1.00' Flow Area= 66.7 sf, Capacity= 252.44 cfs

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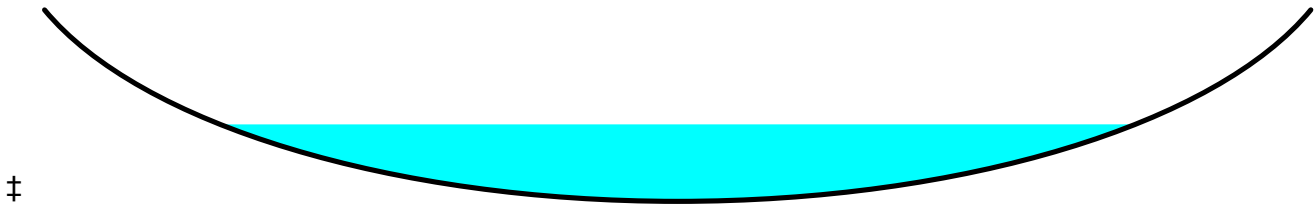
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100.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 527.0' Slope= 0.0100 '/'
Inlet Invert= 31.29', Outlet Invert= 26.00'



Summary for Reach R3: REACH 3

Inflow Area = 2,380,909 sf, 3.30% Impervious, Inflow Depth = 4.16" for 50-Yr event
Inflow = 50.95 cfs @ 13.20 hrs, Volume= 826,044 cf
Outflow = 50.29 cfs @ 13.29 hrs, Volume= 826,043 cf, Atten= 1%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.26 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 9.2 min

Peak Storage= 8,357 cf @ 13.24 hrs
Average Depth at Peak Storage= 1.15'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 141.56 cfs

6.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 874.0' Slope= 0.0138 '/'
Inlet Invert= 26.00', Outlet Invert= 13.90'



Summary for Reach R3.1: REACH 3.1

Inflow Area = 51,845 sf, 73.70% Impervious, Inflow Depth = 6.43" for 50-Yr event
Inflow = 6.73 cfs @ 12.12 hrs, Volume= 27,763 cf
Outflow = 4.81 cfs @ 12.22 hrs, Volume= 27,763 cf, Atten= 29%, Lag= 6.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.94 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 0.36 fps, Avg. Travel Time= 8.4 min

Peak Storage= 912 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 833.80 cfs

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50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 179.0' Slope= 0.0056 '/'
Inlet Invert= 24.90', Outlet Invert= 23.90'



Summary for Reach R3.2: REACH 3.2

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 5.03" for 50-Yr event
Inflow = 1.44 cfs @ 12.07 hrs, Volume= 4,357 cf
Outflow = 1.40 cfs @ 12.12 hrs, Volume= 4,357 cf, Atten= 3%, Lag= 2.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.91 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 2.3 min

Peak Storage= 141 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 2.00' Flow Area= 140.0 sf, Capacity= 1,651.08 cfs

50.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 10.0 '/' Top Width= 90.00'
Length= 91.3' Slope= 0.0219 '/'
Inlet Invert= 26.90', Outlet Invert= 24.90'



Summary for Reach R4: REACH 4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 4.76" for 50-Yr event
Inflow = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf
Outflow = 61.80 cfs @ 12.52 hrs, Volume= 451,402 cf, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.02 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1,478 cf @ 12.51 hrs
Average Depth at Peak Storage= 1.22'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 157.25 cfs

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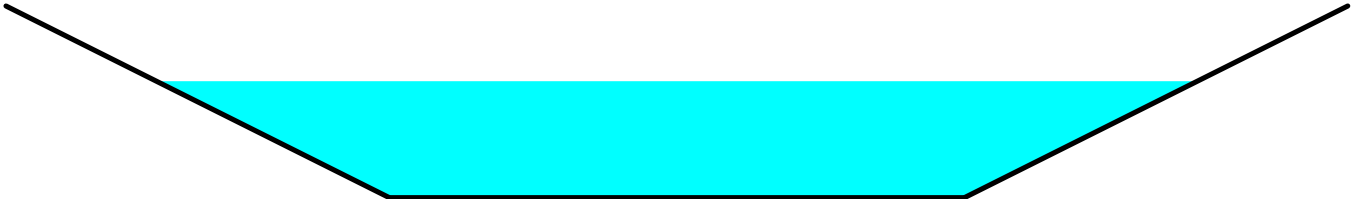
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6.00' x 2.00' deep channel, $n = 0.030$ Stream, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 14.00'

Length= 144.0' Slope= 0.0171 ' '

Inlet Invert= 16.36', Outlet Invert= 13.90'



Summary for Reach R4.1: REACH 4.1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 6.94" for 50-Yr event
Inflow = 5.53 cfs @ 12.11 hrs, Volume= 21,238 cf
Outflow = 4.29 cfs @ 12.26 hrs, Volume= 21,238 cf, Atten= 23%, Lag= 8.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 1.77 fps, Min. Travel Time= 5.2 min

Avg. Velocity = 0.55 fps, Avg. Travel Time= 16.7 min

Peak Storage= 1,335 cf @ 12.17 hrs

Average Depth at Peak Storage= 0.18'

Bank-Full Depth= 2.00' Flow Area= 56.0 sf, Capacity= 390.71 cfs

12.00' x 2.00' deep channel, $n = 0.030$ Earth, grassed & winding

Side Slope Z-value= 8.0 ' ' Top Width= 44.00'

Length= 552.0' Slope= 0.0145 ' '

Inlet Invert= 22.00', Outlet Invert= 14.00'



Summary for Reach R5: REACH 5

Inflow Area = 4,565,673 sf, 15.80% Impervious, Inflow Depth = 4.51" for 50-Yr event
Inflow = 148.14 cfs @ 12.60 hrs, Volume= 1,717,655 cf
Outflow = 148.12 cfs @ 12.62 hrs, Volume= 1,717,655 cf, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 8.19 fps, Min. Travel Time= 0.6 min

Avg. Velocity = 2.08 fps, Avg. Travel Time= 2.5 min

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Peak Storage= 5,737 cf @ 12.61 hrs

Average Depth at Peak Storage= 2.01'

Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 147.04 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 13.00'

Length= 317.0' Slope= 0.0134 ' '

Inlet Invert= 13.90', Outlet Invert= 9.64'



Summary for Reach R6: REACH 6

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 4.55" for 50-Yr event

Inflow = 55.52 cfs @ 12.55 hrs, Volume= 367,756 cf

Outflow = 55.51 cfs @ 12.56 hrs, Volume= 367,756 cf, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Max. Velocity= 6.37 fps, Min. Travel Time= 0.3 min

Avg. Velocity = 1.78 fps, Avg. Travel Time= 1.2 min

Peak Storage= 1,160 cf @ 12.55 hrs

Average Depth at Peak Storage= 0.49'

Bank-Full Depth= 2.00' Flow Area= 42.0 sf, Capacity= 623.19 cfs

17.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding

Side Slope Z-value= 2.0 ' ' Top Width= 25.00'

Length= 133.0' Slope= 0.0328 ' '

Inlet Invert= 23.90', Outlet Invert= 19.54'



Summary for Pond AP3: 4 - 24"CMP

Inflow Area = 4,698,353 sf, 15.58% Impervious, Inflow Depth = 4.53" for 50-Yr event

Inflow = 152.35 cfs @ 12.60 hrs, Volume= 1,773,875 cf

Outflow = 133.67 cfs @ 12.76 hrs, Volume= 1,762,434 cf, Atten= 12%, Lag= 9.9 min

Primary = 114.14 cfs @ 12.76 hrs, Volume= 1,756,365 cf

Secondary = 19.53 cfs @ 12.76 hrs, Volume= 6,068 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 6

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Peak Elev= 17.03' @ 12.76 hrs Surf.Area= 44,026 sf Storage= 96,037 cf

Plug-Flow detention time= 11.0 min calculated for 1,762,067 cf (99% of inflow)

Center-of-Mass det. time= 6.5 min (908.4 - 901.8)

Volume	Invert	Avail.Storage	Storage Description
#1	9.64'	96,037 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
9.64	0	0	0
10.00	856	154	154
12.00	4,037	4,893	5,047
14.00	13,588	17,625	22,672
16.00	39,016	52,604	75,276
16.50	44,026	20,761	96,037

Device	Routing	Invert	Outlet Devices
#1	Primary	9.77'	24.0" Round Proposed 3 - 24" CMP X 3.00 L= 65.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.12' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#2	Primary	9.83'	24.0" Round Existing 24" CMP L= 64.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 9.77' / 9.83' S= -0.0009 ' S= -0.0009 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf
#3	Secondary	16.50'	20.0' long x 25.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=113.49 cfs @ 12.76 hrs HW=16.97' (Free Discharge)↑ **1=Proposed 3 - 24" CMP** (Barrel Controls 86.25 cfs @ 9.15 fps)↑ **2=Existing 24" CMP** (Barrel Controls 27.24 cfs @ 8.67 fps)**Secondary OutFlow** Max=17.22 cfs @ 12.76 hrs HW=16.97' (Free Discharge)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 17.22 cfs @ 1.84 fps)**Summary for Pond C3: CULV-3**

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 3.87" for 50-Yr event
 Inflow = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf
 Outflow = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf, Atten= 0%, Lag= 0.0 min
 Primary = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.51' @ 13.45 hrs

Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.60'	24.0" Round Culvert L= 169.0' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 31.60' / 30.00' S= 0.0095 ' / ' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 3.14 sf

Primary OutFlow Max=15.78 cfs @ 13.45 hrs HW=33.51' TW=31.60' (Fixed TW Elev= 31.60')

↑**1=Culvert** (Outlet Controls 15.78 cfs @ 6.55 fps)

Summary for Pond C4: CULV-4

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 4.76" for 50-Yr event
 Inflow = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf
 Outflow = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf, Atten= 0%, Lag= 0.0 min
 Primary = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 30.18' @ 12.51 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	16.79'	24.0" Round Culvert L= 86.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 16.79' / 16.36' S= 0.0050 ' / ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

Primary OutFlow Max=61.80 cfs @ 12.51 hrs HW=30.18' (Free Discharge)

↑**1=Culvert** (Barrel Controls 61.80 cfs @ 19.67 fps)

Summary for Pond C7: CULV-7

Inflow Area = 969,810 sf, 35.76% Impervious, Inflow Depth = 4.55" for 50-Yr event
 Inflow = 55.51 cfs @ 12.56 hrs, Volume= 367,756 cf
 Outflow = 55.63 cfs @ 12.56 hrs, Volume= 367,860 cf, Atten= 0%, Lag= 0.0 min
 Primary = 33.07 cfs @ 12.56 hrs, Volume= 335,031 cf
 Secondary = 22.56 cfs @ 12.56 hrs, Volume= 32,828 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8
 Peak Elev= 23.51' @ 12.56 hrs Surf.Area= 7,106 sf Storage= 9,728 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 1.7 min (852.5 - 850.8)

Volume	Invert	Avail.Storage	Storage Description
#1	19.54'	9,728 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
19.54	0	0	0
20.00	144	33	33
21.00	890	517	550
22.00	2,015	1,453	2,003
23.00	6,588	4,302	6,304
23.50	7,106	3,424	9,728

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Device	Routing	Invert	Outlet Devices
#1	Primary	19.54'	24.0" Round 24" RCP L= 184.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 19.54' / 16.79' S= 0.0149 '/ Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	23.40'	250.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=33.07 cfs @ 12.56 hrs HW=23.51' (Free Discharge)↑**1=24" RCP** (Barrel Controls 33.07 cfs @ 10.53 fps)**Secondary OutFlow** Max=22.38 cfs @ 12.56 hrs HW=23.51' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 22.38 cfs @ 0.83 fps)**Summary for Pond CB5: CB-5**

Inflow Area = 1,672 sf, 27.51% Impervious, Inflow Depth = 4.75" for 50-Yr event
 Inflow = 0.22 cfs @ 12.07 hrs, Volume= 662 cf
 Outflow = 0.22 cfs @ 12.07 hrs, Volume= 662 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.22 cfs @ 12.07 hrs, Volume= 662 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 979.45' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	29.50'	1.0" Round 12" CULV L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 29.50' / 29.15' S= 0.0050 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.01 sf

Primary OutFlow Max=0.22 cfs @ 12.07 hrs HW=975.65' (Free Discharge)↑**1=12" CULV** (Barrel Controls 0.22 cfs @ 40.26 fps)**Summary for Pond CB6: CB-6**

Inflow Area = 10,394 sf, 12.10% Impervious, Inflow Depth = 5.03" for 50-Yr event
 Inflow = 1.44 cfs @ 12.07 hrs, Volume= 4,357 cf
 Outflow = 1.44 cfs @ 12.07 hrs, Volume= 4,357 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.44 cfs @ 12.07 hrs, Volume= 4,357 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 28.55' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.82'	12.0" Round 12"SD L= 184.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 27.82' / 26.90' S= 0.0050 '/ Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 0.79 sf

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Primary OutFlow Max=1.44 cfs @ 12.07 hrs HW=28.55' (Free Discharge)

↑1=12"SD (Barrel Controls 1.44 cfs @ 3.28 fps)

Summary for Pond DMH-1: DMH-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 6.94" for 50-Yr event
 Inflow = 6.23 cfs @ 12.07 hrs, Volume= 21,238 cf
 Outflow = 6.23 cfs @ 12.07 hrs, Volume= 21,238 cf, Atten= 0%, Lag= 0.0 min
 Primary = 6.23 cfs @ 12.07 hrs, Volume= 21,238 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 33.80' @ 12.07 hrs

Flood Elev= 36.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.58'	24.0" Round 24" SD to Detention Bed L= 30.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 32.58' / 32.35' S= 0.0077 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=6.23 cfs @ 12.07 hrs HW=33.80' (Free Discharge)

↑1=24" SD to Detention Bed (Barrel Controls 6.23 cfs @ 4.45 fps)

Summary for Pond DMH-6: DMH-6

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 6.82" for 50-Yr event
 Inflow = 7.00 cfs @ 12.07 hrs, Volume= 23,567 cf
 Outflow = 7.00 cfs @ 12.07 hrs, Volume= 23,567 cf, Atten= 0%, Lag= 0.0 min
 Primary = 7.00 cfs @ 12.07 hrs, Volume= 23,567 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 31.30' @ 12.07 hrs

Flood Elev= 32.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	30.13'	24.0" Round 24" SD to Detention Bed L= 6.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 30.13' / 28.90' S= 0.2050 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.00 cfs @ 12.07 hrs HW=31.30' (Free Discharge)

↑1=24" SD to Detention Bed (Inlet Controls 7.00 cfs @ 3.68 fps)

Summary for Pond OC1: OFFSITE CULV-1

Inflow Area = 1,467,784 sf, 3.67% Impervious, Inflow Depth = 3.87" for 50-Yr event
 Inflow = 87.48 cfs @ 12.41 hrs, Volume= 473,256 cf
 Outflow = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf, Atten= 82%, Lag= 62.6 min
 Primary = 15.78 cfs @ 13.45 hrs, Volume= 473,246 cf

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Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 37.48' @ 13.45 hrs Surf.Area= 119,215 sf Storage= 202,628 cf

Plug-Flow detention time= 144.2 min calculated for 473,246 cf (100% of inflow)

Center-of-Mass det. time= 144.1 min (994.5 - 850.3)

Volume	Invert	Avail.Storage	Storage Description
#1	34.25'	602,689 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.25	5,289	0	0
36.00	67,698	63,864	63,864
38.00	137,090	204,788	268,652
40.00	196,947	334,037	602,689

Device	Routing	Invert	Outlet Devices
#1	Primary	34.25'	18.0" Round 18" RCP L= 97.6' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 34.25' / 32.29' S= 0.0201 ' S= 0.0201 ' Cc= 0.900 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=15.78 cfs @ 13.45 hrs HW=37.48' (Free Discharge)↑**1=18" RCP** (Barrel Controls 15.78 cfs @ 8.93 fps)**Summary for Pond OC2: OFFSITE CULV-2**

Inflow Area = 913,125 sf, 2.70% Impervious, Inflow Depth = 4.64" for 50-Yr event
 Inflow = 45.22 cfs @ 12.80 hrs, Volume= 352,800 cf
 Outflow = 45.49 cfs @ 13.02 hrs, Volume= 352,800 cf, Atten= 0%, Lag= 13.4 min
 Primary = 45.49 cfs @ 13.02 hrs, Volume= 352,800 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 62.75' @ 13.02 hrs Surf.Area= 30,513 sf Storage= 71,548 cf

Plug-Flow detention time= 38.2 min calculated for 352,800 cf (100% of inflow)

Center-of-Mass det. time= 38.1 min (900.4 - 862.3)

Volume	Invert	Avail.Storage	Storage Description
#1	32.88'	71,548 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.88	5,285	0	0
34.00	8,520	7,731	7,731
36.00	12,392	20,912	28,643
38.00	30,513	42,905	71,548

Device	Routing	Invert	Outlet Devices
#1	Primary	32.88'	18.0" Round 18" RCP L= 93.6' RCP, groove end projecting, Ke= 0.200

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Inlet / Outlet Invert= 32.88' / 31.29' S= 0.0170 ' / ' Cc= 0.900
 n= 0.013 Concrete, trowel finish, Flow Area= 1.77 sf

Primary OutFlow Max=45.49 cfs @ 13.02 hrs HW=62.75' (Free Discharge)

Summary for Pond P3.1: STORMTECH DETENTION / OCS-2

Inflow Area = 41,451 sf, 89.14% Impervious, Inflow Depth = 6.82" for 50-Yr event
 Inflow = 7.00 cfs @ 12.07 hrs, Volume= 23,567 cf
 Outflow = 5.33 cfs @ 12.12 hrs, Volume= 23,406 cf, Atten= 24%, Lag= 3.2 min
 Primary = 5.33 cfs @ 12.12 hrs, Volume= 23,406 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 31.27' @ 12.12 hrs Surf.Area= 3,328 sf Storage= 7,258 cf
 Flood Elev= 31.21' Surf.Area= 3,328 sf Storage= 7,258 cf

Plug-Flow detention time= 126.3 min calculated for 23,401 cf (99% of inflow)
 Center-of-Mass det. time= 121.7 min (874.9 - 753.2)

Volume	Invert	Avail.Storage	Storage Description
#1	27.67'	2,926 cf	34.70'W x 95.90'L x 3.50'H Prismatic 11,647 cf Overall - 4,331 cf Embedded = 7,316 cf x 40.0% Voids
#2	28.17'	4,331 cf	ADS_StormTech SC-740 @ 95.90' L x 7 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 95.90'L = 618.8 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
7,258 cf			Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	25.15'	24.0" Round 24" SD L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 25.15' / 25.00' S= 0.0100 ' / ' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	25.15'	2.0" Vert. 2" Orifice C= 0.600
#3	Device 1	29.12'	4.0" Vert. 4" Orifice C= 0.600
#4	Device 1	30.90'	6.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=5.08 cfs @ 12.12 hrs HW=31.26' (Free Discharge)

Summary for Pond P4.1: STORMTECH DETENTION / OCS-1

Inflow Area = 36,714 sf, 95.49% Impervious, Inflow Depth = 6.94" for 50-Yr event
 Inflow = 6.23 cfs @ 12.07 hrs, Volume= 21,238 cf
 Outflow = 5.53 cfs @ 12.11 hrs, Volume= 21,238 cf, Atten= 11%, Lag= 2.4 min
 Primary = 5.53 cfs @ 12.11 hrs, Volume= 21,238 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 4

Campus - Post Development

Type III 24-hr 50-Yr Rainfall=7.30"

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Peak Elev= 34.08' @ 12.11 hrs Surf.Area= 1,702 sf Storage= 2,775 cf

Flood Elev= 34.78' Surf.Area= 1,702 sf Storage= 3,388 cf

Plug-Flow detention time= 8.9 min calculated for 21,234 cf (100% of inflow)

Center-of-Mass det. time= 8.9 min (756.6 - 747.7)

Volume	Invert	Avail.Storage	Storage Description
#1	31.72'	1,513 cf	25.25'W x 67.40'L x 3.50'H Prismatic 5,956 cf Overall - 2,174 cf Embedded = 3,782 cf x 40.0% Voids
#2	32.22'	2,174 cf	ADS_StormTech SC-740 @ 67.40' L x 5 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 67.40'L = 434.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
		3,687 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	28.76'	24.0" Round 24" SD L= 268.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 28.76' / 22.00' S= 0.0252 ' / Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	28.76'	4.0" Vert. 4" Orifice C= 0.600
#3	Device 1	32.90'	6.0" Vert. 6" Orifice C= 0.600
#4	Device 1	33.65'	4.0' long x 2.00' rise Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)

Primary OutFlow Max=5.53 cfs @ 12.11 hrs HW=34.08' (Free Discharge)

1=24" SD (Passes 5.53 cfs of 24.81 cfs potential flow)

2=4" Orifice (Orifice Controls 0.95 cfs @ 10.93 fps)

3=6" Orifice (Orifice Controls 0.91 cfs @ 4.64 fps)

4=Sharp-Crested Vee/Trap Weir (Weir Controls 3.67 cfs @ 2.14 fps)

Summary for Pond W: WETLAND

Inflow Area = 917,965 sf, 33.62% Impervious, Inflow Depth = 4.44" for 50-Yr event

Inflow = 54.03 cfs @ 12.50 hrs, Volume= 339,993 cf

Outflow = 53.36 cfs @ 12.56 hrs, Volume= 339,993 cf, Atten= 1%, Lag= 3.6 min

Primary = 53.36 cfs @ 12.56 hrs, Volume= 339,993 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 8

Peak Elev= 24.81' @ 12.56 hrs Surf.Area= 17,181 sf Storage= 7,143 cf

Plug-Flow detention time= 1.3 min calculated for 339,922 cf (100% of inflow)

Center-of-Mass det. time= 1.3 min (847.7 - 846.5)

Volume	Invert	Avail.Storage	Storage Description
#1	23.90'	42,267 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.90	0	0	0
24.00	412	21	21
26.00	41,834	42,246	42,267

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Type III 24-hr 50-Yr Rainfall=7.30"

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Device	Routing	Invert	Outlet Devices
#1	Primary	23.90'	152.0 deg x 17.0' long Sharp-Crested Vee/Trap Weir Cv= 2.47 (C= 3.09)

Primary OutFlow Max=53.35 cfs @ 12.56 hrs HW=24.81' (Free Discharge)

↑**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 53.35 cfs @ 2.84 fps)

Summary for Link AP1: AP 1

Inflow Area = 1,136,863 sf, 36.86% Impervious, Inflow Depth = 4.76" for 50-Yr event
Inflow = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf
Primary = 61.80 cfs @ 12.51 hrs, Volume= 451,402 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link AP2: AP 2

Inflow Area = 4,698,353 sf, 15.58% Impervious, Inflow Depth = 4.50" for 50-Yr event
Inflow = 133.67 cfs @ 12.76 hrs, Volume= 1,762,434 cf
Primary = 133.67 cfs @ 12.76 hrs, Volume= 1,762,434 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Appendix C: Stormwater BMP Calculations and Biddeford Stormwater Tables

Buffer with Stone Berm Level Spreader Calculations (refer to 2016 Tennis Courts stormwater report for existing calculations)

Level Spreader 1

Existing length required = 23'

Existing length provided = 25'

Additional length required (75' buffer on HSG A soil)

New impervious area = $(543 \text{ SF} / 43560 \text{ SF/Ac})(75 \text{ ft}) = 0.9 \text{ ft}$

Total length required = $23' + 0.9' = 24' < 25' \text{ provided} \Rightarrow \text{OK}$

Level Spreader 2

Existing length required = 23'

Existing length provided = 25'

Additional length required (75' buffer on HSG A soil)

New impervious area = $(687 \text{ SF} / 43560 \text{ SF/Ac})(75 \text{ ft}) = 1.2 \text{ ft}$

Total length required = $23' + 1.2' = 24.2' < 25' \text{ provided} \Rightarrow \text{OK}$

Soil Filter SF1 BMP Calculations							
Subcatchment Area	New Impervious Area (SF)	New Landscaped Area (SF)	New Developed Area (SF)	CPV Required ¹ (CF)	CPV Provided (CF)	Filter Area Required ² (CF)	Filter Area Provided (CF)
TREATED AREAS							
3	16,914	4,653	21,567	1,557	1,557	939	972
Notes: 1. Channel Protection Volume (CPV) required is calculated as 1" over the contributing impervious area plus 0.4" over the contributing landscaped area 2. Filter area required is calculated at 5% of contributing impervious area and 2% of contributing landscaped area.							

23103 SOIL FILTER

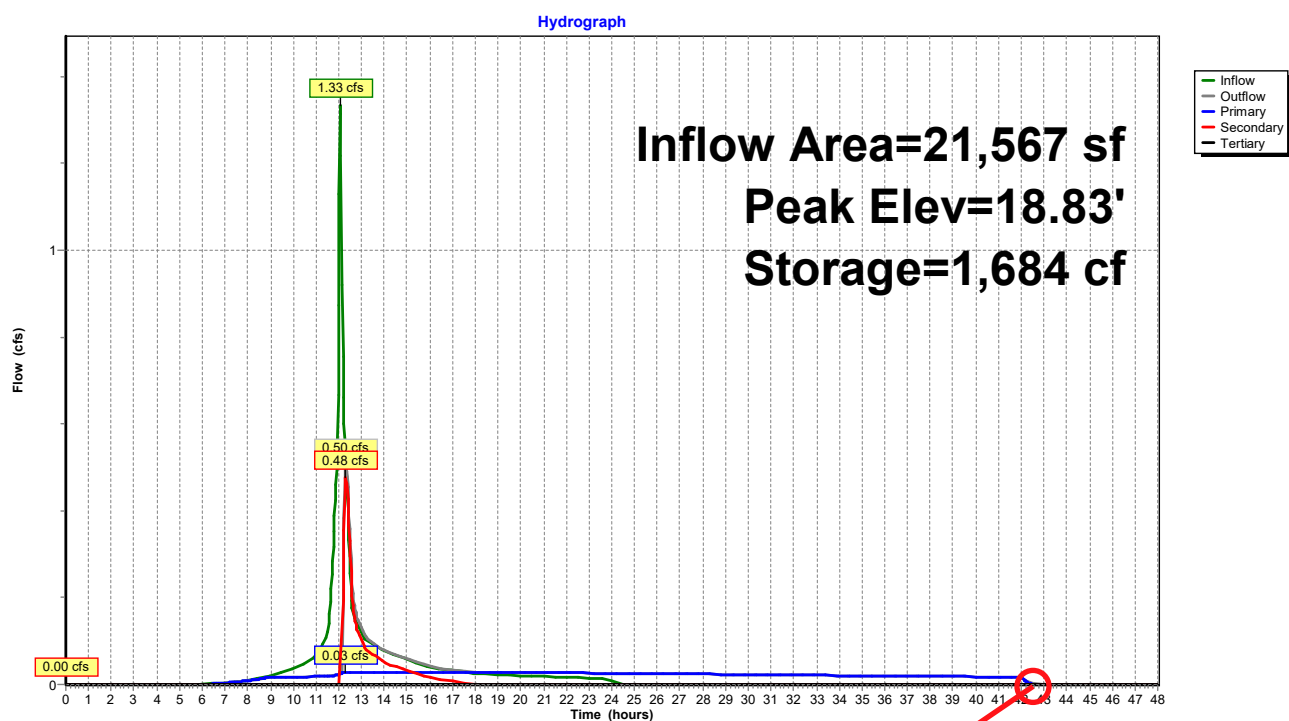
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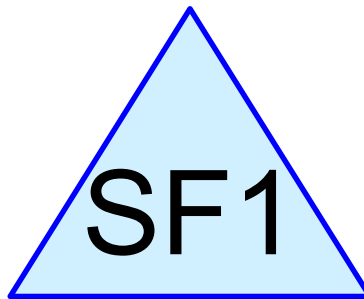
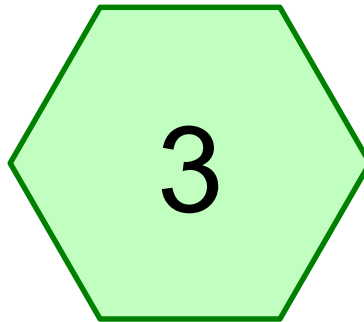
Type III 24-hr 2-Yr Storm Rainfall=3.30"

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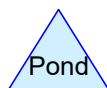
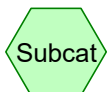
Pond SF1: Soil Filter



soil filter
drains in 42
hours



Soil Filter



Routing Diagram for SOIL FILTER

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SOIL FILTER

Type III 24-hr 2-Yr Storm Rainfall=3.30"

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Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3:

Runoff Area=21,567 sf 78.43% Impervious Runoff Depth=2.64"
Tc=5.0 min CN=94 Runoff=1.51 cfs 4,746 cf

Pond SF1: Soil Filter

Peak Elev=18.88' Storage=1,754 cf Inflow=1.51 cfs 4,746 cf
Primary=0.03 cfs 2,937 cf Secondary=0.91 cfs 1,809 cf Tertiary=0.00 cfs 0 cf Outflow=0.94 cfs 4,746 cf

Total Runoff Area = 21,567 sf Runoff Volume = 4,746 cf Average Runoff Depth = 2.64"
21.57% Pervious = 4,653 sf 78.43% Impervious = 16,914 sf

SOIL FILTER

Type III 24-hr 2-Yr Storm Rainfall=3.30"

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Summary for Subcatchment 3:

Runoff = 1.51 cfs @ 12.07 hrs, Volume= 4,746 cf, Depth= 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.30"

	Area (sf)	CN	Description
*	16,914	98	Impervious
	4,653	80	>75% Grass cover, Good, HSG D
	21,567	94	Weighted Average
	4,653		21.57% Pervious Area
	16,914		78.43% Impervious Area

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

Summary for Pond SF1: Soil Filter

Inflow Area = 21,567 sf, 78.43% Impervious, Inflow Depth = 2.64" for 2-Yr Storm event
 Inflow = 1.51 cfs @ 12.07 hrs, Volume= 4,746 cf
 Outflow = 0.94 cfs @ 12.17 hrs, Volume= 4,746 cf, Atten= 38%, Lag= 5.6 min
 Primary = 0.03 cfs @ 12.17 hrs, Volume= 2,937 cf
 Secondary = 0.91 cfs @ 12.17 hrs, Volume= 1,809 cf
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Peak Elev= 18.88' @ 12.17 hrs Surf.Area= 1,593 sf Storage= 1,754 cf

Plug-Flow detention time= 397.5 min calculated for 4,744 cf (100% of inflow)
 Center-of-Mass det. time= 397.9 min (1,183.1 - 785.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	17.50'	3,842 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
17.50	972	134.0	0	0	972
18.00	1,179	143.0	537	537	1,182
18.75	1,550	165.0	1,020	1,557	1,734
19.00	1,636	162.0	398	1,955	1,822
20.00	2,150	181.0	1,887	3,842	2,368

Device	Routing	Invert	Outlet Devices						
#1	Primary	17.50'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'						
#2	Secondary	18.75'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads						
#3	Tertiary	19.00'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63						

SOIL FILTER

Type III 24-hr 2-Yr Storm Rainfall=3.30"

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Primary OutFlow Max=0.03 cfs @ 12.17 hrs HW=18.87' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Secondary OutFlow Max=0.90 cfs @ 12.17 hrs HW=18.87' (Free Discharge)

↑**2=Orifice/Grate** (Weir Controls 0.90 cfs @ 1.15 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.50' (Free Discharge)

↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

SOIL FILTER

Type III 24-hr 10-Yr Storm Rainfall=4.90"

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Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3:

Runoff Area=21,567 sf 78.43% Impervious Runoff Depth=4.21"
Tc=5.0 min CN=94 Runoff=2.34 cfs 7,565 cf

Pond SF1: Soil Filter

Peak Elev=18.97' Storage=1,911 cf Inflow=2.34 cfs 7,565 cf
Primary=0.03 cfs 3,216 cf Secondary=2.16 cfs 4,349 cf Tertiary=0.00 cfs 0 cf Outflow=2.19 cfs 7,565 cf

Total Runoff Area = 21,567 sf Runoff Volume = 7,565 cf Average Runoff Depth = 4.21"
21.57% Pervious = 4,653 sf 78.43% Impervious = 16,914 sf

SOIL FILTER

Type III 24-hr 10-Yr Storm Rainfall=4.90"

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Summary for Subcatchment 3:

Runoff = 2.34 cfs @ 12.07 hrs, Volume= 7,565 cf, Depth= 4.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.90"

	Area (sf)	CN	Description
*	16,914	98	Impervious
	4,653	80	>75% Grass cover, Good, HSG D
	21,567	94	Weighted Average
	4,653		21.57% Pervious Area
	16,914		78.43% Impervious Area

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

Summary for Pond SF1: Soil Filter

Inflow Area = 21,567 sf, 78.43% Impervious, Inflow Depth = 4.21" for 10-Yr Storm event
 Inflow = 2.34 cfs @ 12.07 hrs, Volume= 7,565 cf
 Outflow = 2.19 cfs @ 12.10 hrs, Volume= 7,565 cf, Atten= 7%, Lag= 1.8 min
 Primary = 0.03 cfs @ 12.10 hrs, Volume= 3,216 cf
 Secondary = 2.16 cfs @ 12.10 hrs, Volume= 4,349 cf
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Peak Elev= 18.97' @ 12.10 hrs Surf.Area= 1,626 sf Storage= 1,911 cf

Plug-Flow detention time= 280.0 min calculated for 7,561 cf (100% of inflow)
 Center-of-Mass det. time= 280.6 min (1,053.7 - 773.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	17.50'	3,842 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
17.50	972	134.0	0	0	972
18.00	1,179	143.0	537	537	1,182
18.75	1,550	165.0	1,020	1,557	1,734
19.00	1,636	162.0	398	1,955	1,822
20.00	2,150	181.0	1,887	3,842	2,368

Device	Routing	Invert	Outlet Devices						
#1	Primary	17.50'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'						
#2	Secondary	18.75'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads						
#3	Tertiary	19.00'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63						

SOIL FILTER

Type III 24-hr 10-Yr Storm Rainfall=4.90"

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Primary OutFlow Max=0.03 cfs @ 12.10 hrs HW=18.97' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Secondary OutFlow Max=2.13 cfs @ 12.10 hrs HW=18.97' (Free Discharge)

↑**2=Orifice/Grate** (Weir Controls 2.13 cfs @ 1.54 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.50' (Free Discharge)

↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Type III 24-hr 25-Yr Storm Rainfall=6.20"

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Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3:

Runoff Area=21,567 sf 78.43% Impervious Runoff Depth=5.49"

Tc=5.0 min CN=94 Runoff=3.01 cfs 9,875 cf

Pond SF1: Soil Filter

Peak Elev=19.01' Storage=1,978 cf Inflow=3.01 cfs 9,875 cf

Primary=0.03 cfs 3,331 cf Secondary=2.79 cfs 6,538 cf Tertiary=0.04 cfs 7 cf Outflow=2.86 cfs 9,875 cf

Total Runoff Area = 21,567 sf Runoff Volume = 9,875 cf Average Runoff Depth = 5.49"
21.57% Pervious = 4,653 sf 78.43% Impervious = 16,914 sf

SOIL FILTER

Type III 24-hr 25-Yr Storm Rainfall=6.20"

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Summary for Subcatchment 3:

Runoff = 3.01 cfs @ 12.07 hrs, Volume= 9,875 cf, Depth= 5.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-Yr Storm Rainfall=6.20"

	Area (sf)	CN	Description
*	16,914	98	Impervious
	4,653	80	>75% Grass cover, Good, HSG D
	21,567	94	Weighted Average
	4,653		21.57% Pervious Area
	16,914		78.43% Impervious Area

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

Summary for Pond SF1: Soil Filter

Inflow Area = 21,567 sf, 78.43% Impervious, Inflow Depth = 5.49" for 25-Yr Storm event
 Inflow = 3.01 cfs @ 12.07 hrs, Volume= 9,875 cf
 Outflow = 2.86 cfs @ 12.10 hrs, Volume= 9,875 cf, Atten= 5%, Lag= 1.6 min
 Primary = 0.03 cfs @ 12.10 hrs, Volume= 3,331 cf
 Secondary = 2.79 cfs @ 12.10 hrs, Volume= 6,538 cf
 Tertiary = 0.04 cfs @ 12.09 hrs, Volume= 7 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Peak Elev= 19.01' @ 12.10 hrs Surf.Area= 1,643 sf Storage= 1,978 cf

Plug-Flow detention time= 226.1 min calculated for 9,875 cf (100% of inflow)
 Center-of-Mass det. time= 226.0 min (992.7 - 766.7)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	3,842 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
17.50	972	134.0	0	0	972
18.00	1,179	143.0	537	537	1,182
18.75	1,550	165.0	1,020	1,557	1,734
19.00	1,636	162.0	398	1,955	1,822
20.00	2,150	181.0	1,887	3,842	2,368

Device	Routing	Invert	Outlet Devices
#1	Primary	17.50'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Secondary	18.75'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Tertiary	19.00'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

SOIL FILTER

Type III 24-hr 25-Yr Storm Rainfall=6.20"

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Primary OutFlow Max=0.03 cfs @ 12.10 hrs HW=19.01' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Secondary OutFlow Max=2.75 cfs @ 12.10 hrs HW=19.01' (Free Discharge)

↑**2=Orifice/Grate** (Weir Controls 2.75 cfs @ 1.67 fps)

Tertiary OutFlow Max=0.04 cfs @ 12.09 hrs HW=19.01' (Free Discharge)

↑**3=Broad-Crested Rectangular Weir** (Weir Controls 0.04 cfs @ 0.30 fps)

SOIL FILTER

Type III 24-hr 50-Yr Storm Rainfall=7.30"

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Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3:

Runoff Area=21,567 sf 78.43% Impervious Runoff Depth=6.59"

Tc=5.0 min CN=94 Runoff=3.57 cfs 11,837 cf

Pond SF1: Soil Filter

Peak Elev=19.04' Storage=2,022 cf Inflow=3.57 cfs 11,837 cf

Primary=0.03 cfs 3,394 cf Secondary=3.21 cfs 8,388 cf Tertiary=0.22 cfs 55 cf Outflow=3.46 cfs 11,837 cf

Total Runoff Area = 21,567 sf Runoff Volume = 11,837 cf Average Runoff Depth = 6.59"
21.57% Pervious = 4,653 sf 78.43% Impervious = 16,914 sf

SOIL FILTER

Type III 24-hr 50-Yr Storm Rainfall=7.30"

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Summary for Subcatchment 3:

Runoff = 3.57 cfs @ 12.07 hrs, Volume= 11,837 cf, Depth= 6.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-Yr Storm Rainfall=7.30"

	Area (sf)	CN	Description
*	16,914	98	Impervious
	4,653	80	>75% Grass cover, Good, HSG D
	21,567	94	Weighted Average
	4,653		21.57% Pervious Area
	16,914		78.43% Impervious Area

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

Summary for Pond SF1: Soil Filter

Inflow Area = 21,567 sf, 78.43% Impervious, Inflow Depth = 6.59" for 50-Yr Storm event
 Inflow = 3.57 cfs @ 12.07 hrs, Volume= 11,837 cf
 Outflow = 3.46 cfs @ 12.09 hrs, Volume= 11,837 cf, Atten= 3%, Lag= 1.4 min
 Primary = 0.03 cfs @ 12.09 hrs, Volume= 3,394 cf
 Secondary = 3.21 cfs @ 12.09 hrs, Volume= 8,388 cf
 Tertiary = 0.22 cfs @ 12.09 hrs, Volume= 55 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
 Peak Elev= 19.04' @ 12.09 hrs Surf.Area= 1,655 sf Storage= 2,022 cf

Plug-Flow detention time= 194.0 min calculated for 11,830 cf (100% of inflow)
 Center-of-Mass det. time= 194.6 min (957.3 - 762.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	17.50'	3,842 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
17.50	972	134.0	0	0	972
18.00	1,179	143.0	537	537	1,182
18.75	1,550	165.0	1,020	1,557	1,734
19.00	1,636	162.0	398	1,955	1,822
20.00	2,150	181.0	1,887	3,842	2,368

Device	Routing	Invert	Outlet Devices						
#1	Primary	17.50'	0.750 in/hr Exfiltration over Surface area Phase-In= 0.01'						
#2	Secondary	18.75'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads						
#3	Tertiary	19.00'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63						

SOIL FILTER

Type III 24-hr 50-Yr Storm Rainfall=7.30"

Prepared by Site Design Associates

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Primary OutFlow Max=0.03 cfs @ 12.09 hrs HW=19.04' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Secondary OutFlow Max=3.19 cfs @ 12.09 hrs HW=19.04' (Free Discharge)

↑**2=Orifice/Grate** (Weir Controls 3.19 cfs @ 1.76 fps)

Tertiary OutFlow Max=0.21 cfs @ 12.09 hrs HW=19.04' (Free Discharge)

↑**3=Broad-Crested Rectangular Weir** (Weir Controls 0.21 cfs @ 0.53 fps)

UNE TENNIS COURT EXPANSION - PREDEVELOPMENT LAND COVER SUMMARY									
Drainage Area	Area (SF)	Area (AC)	Subdrainage Land Cover Areas		Lawn Area HSG 'D' (SF)	Woods Area HSG 'C' (SF)	Woods Area HSG 'D' (SF)		Tc (hours)
			Impervious Area (SF)	Lawn Area HSG 'C' (SF)					
			CN: 98	CN: 79	CN: 84	CN: 73	CN: 79		
S4	1,011,187	23.21	171,450	20,781	7,642	419,188	374,994	80	0.77
TOTAL	1,011,187	23.21	171,450	20,781	7,642	419,188	374,994	80	-

*If a drainage area contains multiple soil types with differing HSG classifications (i.e. 'C' vs 'D'), additional columns should be added for each pervious & gravel hydrologic soil group types (HSG).

UNE TENNIS COURT EXPANSION - POSTDEVELOPMENT LAND COVER SUMMARY									
Drainage Area	Area (SF)	Area (AC)	Subdrainage Land Cover Areas		Lawn Area HSG 'D' (SF)	Woods Area HSG 'C' (SF)	Woods Area HSG 'D' (SF)		Tc (hours)
			Impervious Area (SF)	Lawn Area HSG 'C' (SF)					
			CN: 98	CN: 79	CN: 84	CN: 73	CN: 79		
S4	1,011,187	23.21	188,582	20,781	11,998	419,118	370,638	80	0.77
TOTAL	1,011,187	23.21	188,582	20,781	11,998	419,118	370,638	80	-

*If a drainage area contains multiple soil types with differing HSG classifications (i.e. 'C' vs 'D'), additional columns should be added for each pervious & gravel hydrologic soil group types (HSG).

UNE TENNIS COURT EXPANSION - LAND COVER CURVE NUMBER SUMMARY TABLE				
USDA-NRCS SOIL CLASSIFICATION	HYDROLOGIC SOIL GROUP (HSG)	LAND COVER TYPES - CURVE NUMBERS		
		Impervious	Grass, Fair	Woods, Fair
Naumber (Na)	C	98	79	73
Lyman (Ly)	D	98	84	79
Lyman-Rock (Ln)	D	98	84	79

Source: *Urban Hydrology for Small Watersheds* - TR-55

BIDDEFORD - 24 HR RAINFALL DEPTHS	
2-YR	3.3 in
10-YR	4.9 in
25-YR	6.2 in
50-YR	7.3 in
100-YR	8.7 in

*Per Appendix H of DEP's Chapter 500; Type III Storm

TABLE 1 UNE TENNIS COURT EXPANSION - STORMWATER RUNOFF DISCHARGE SUMMARY				
ANALYSIS POINT	STORM FREQUENCY	EXISTING DISCHARGE (CFS)	PROPOSED DISCHARGE (CFS)	NOTES
AP3	Q ₂	41.1	41.1	No Increase
	Q ₁₀	80.7	80.7	No Increase
	Q ₂₅	99.8	99.8	No Increase
	Q ₅₀	155.9	155.9	No Increase

Appendix D:

Inspection & Maintenance Plan

Inspection and Maintenance Plan For Stormwater Management Facilities

**University of New England
Biddeford, Maine**

February 2024

Stormwater management facilities include paved surfaces, ditches/swales, catch basins, culverts, storm drain pipe, detention ponds, wet pond, bioretention cells, grassed underdrain soil filters, and subsurface Stormtech detention chambers. During construction activities, the maintenance of all stormwater measures will be the direct responsibility of the Contractor. After acceptance by the Owner, the maintenance of all stormwater management facilities, the establishment of any contract services required to implement the program, and the keeping of records and maintenance log book will be the responsibility of the University of New England. At a minimum, the following maintenance activities for each stormwater management system shall be performed on a prescribed schedule.

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 have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the facilities.
- (c) 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.

Paved Surfaces

Accumulations of winter sand along paved surfaces shall be cleared at least once a year, preferably in the spring, and periodically during the year on an as-needed basis, to minimize transportation of sediment during rainfall events. Accumulations on pavement may be removed by pavement sweeping or vacuuming. 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.

Ditches and Swales

Open swales and ditches shall be inspected twice per year (in spring and fall) to assure that debris and/or sediments do not reduce the effectiveness of the system. Debris

and sediments shall be removed at that time. Any sign of erosion or blockage shall be immediately repaired to assure a vigorous growth of vegetation for the stability of the ditches and slopes proper function. Maintenance shall include, but not be limited to, mowing, trimming and removal vegetation in the ditches and slopes as required in order to prevent vegetation from blocking or diverting storm flows, replacement of riprap channel lining to prevent scour of the channel invert, removing vegetation and debris from the culverts.

Vegetated ditches should be mowed at least monthly during the growing season. Larger brush or trees must not be allowed to become established in the channel. Any areas where the vegetation fails will be subject to erosion and should be reseeded and mulched immediately.

Riprap ditches and aprons where stone is displaced should be replaced and chinked to assure stability. With time, additional riprap may be added. Vegetation growing through riprap should be removed on an annual basis.

Catch Basins

All catch basins, and any other field inlets throughout the collection system, shall be inspected twice per year (in spring and fall) to assure that the inlet entry and grates are clear of debris and will accept the intended flows. Any debris and sediments shall be cleared.

Sediment should be removed from these structures when it accumulates within 12 inches of the lowest pipe invert. If the basin outlet is designed with a hood to trap floatable materials (i.e. Snout or Casco Bay trap), check to ensure watertight seal is working. At a minimum, remove floating debris and hydrocarbons at the time of the inspection. The removed material must be disposed of in accordance with the Maine Solid Waste Disposal Rules. Confined space entry safety procedures shall be practiced should entry into these structures be required.

Culverts and Storm Drainage Pipes

Culverts and piped drainage systems shall be inspected on an annual basis 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 pipe inlet and outlet. Sediment should be removed when its level exceeds 20% of the pipe diameter. This may be accomplished by hydraulic flushing or any mechanical means; however, care should be taken to contain the sediment at the pipe outlet, and not flush the sediments into the detention/infiltration pond areas as this will reduce the ponds capacity and ability to infiltrate runoff, and will hasten the time when the pond must be cleaned or rehabilitated.

Detention Ponds

Inlets and outlets of ponds should be inspected monthly during wet weather conditions from March to November. Pipe ends and drain grates should be cleared of debris as necessary and inspected for damage.

Ponds should be inspected semi-annually for erosion, destabilization of side slopes, embankment settling and other signs of structural failure, and loss of storage volume due to sediment accumulation. Corrective action should be taken immediately upon identification of problems.

Embankments should be maintained to preserve their integrity as impoundment structures. Maintenance should include mowing and control of woody vegetation at least twice annually; and rodent control and erosion control and repair as needed.

Inspection and maintenance of the ponds is critical to their long term performance. Observations and volume of sediment removed should be recorded in the inspection/maintenance logs.

Wet Pond

The inlet and outlet of the wet pond should be inspected twice per year to ensure that flow structures are not blocked by debris, identify any erosion, destabilization of side slopes, embankment settling, and other signs of structural failure. Corrective action should be taken immediately upon identification of problems.

The gravel trench outlet should be inspected after every major storm in the first few months to ensure proper function. Thereafter, the gravel trench should be inspected at least once every six months. Inspection consists of verifying that the pond is slowly emptying through the gravel filter for a short time (12-24 hours) after a storm and that potentially clogging material such as accumulations of decaying leaves are not preventing discharge through the gravel. The top several inches of gravel in the trench must be replaced with fresh material when water ponds above the permanent pool elevation form more than 72 hours.

Wet ponds lose 0.5% to 1% of their volume annually due to sediment accumulation. Dredging is required when accumulated volume loss reaches 15%, or approximately every 15 to 20 years. Sediment and plant debris should be removed from any pretreatment structure(s) annually.

Grassed Underdrained Soil Filters

The soil filter should be inspected after every major storm in the first few months to ensure proper function. Thereafter, the filter should be inspected at least once every six months to ensure that it is draining within 24 hours.

The top several inches of the filter shall be replaced with fresh material when water ponds on the surface of the bed for more than 72 hours. The removed sediments should be disposed in an acceptable manner.

Sediment and plan debris should be removed from the pretreatment structure at least annually.

Filters with grass cover should be mowed no more than 2 times per growing season to maintain grass heights less than 12 inches.

Fertilization of the underdrained filter area should be avoided unless absolutely necessary to establish vegetation.

Harvesting and pruning of excessive growth will need to be done occasionally. Weeding to control unwanted or invasive plants may also be necessary.

Bioretention Cells

Mowing and removal of woody growth – Bio-retention areas are designed to grow water tolerant plantings and mowing is not required in the interior of the structure. However, the external and top slopes of earthen embankments will be mowed up to three times per growing season to control over growth.

Outlet inspection and cleaning – The Bio-retention outlet consists of a layer of planting loam and sand with a stone and perforated pipe underdrain. Influx of sediments will be limited by sumps on all upstream catch basin structures. Outlet inspections shall include flushing of the underdrain through the cleanout at the end of the pipe. Trash, sediment and debris shall be removed from the vicinity of the outlet and disposed of at a licensed off-site facility. The basin shall be inspected bi annually for evidence of excessive retention or rapid release of flow.

Sediment removal and soil replacement – Every five years the planting soil in the Bio-retention area shall be removed and replaced with clean material. Every effort should be made to retain and re-plant existing vegetation. The stone underdrain shall also be replaced at this time, along with the perforated pipe.

Bioretention cells shall not be used for snow storage area.

Vehicular equipment used to maintain or rehabilitate bioretention cells should work from the basin perimeter and not enter the basin area, as this will compact the soil surface and reduce the design infiltration rate.

Level Spreaders

Long term maintenance of the level spreader is essential to ensure its effectiveness.

-

Inspections - At least once a year and following major storms, the level spreader pool should be inspected for sand accumulation and debris that may reduce its capacity.

-

Sediment Removal - Sediment build-up within the swale should be removed when it has accumulated to approximately 25% of design volume or channel capacity. Dispose of the sediments appropriately.

-
- Debris - Remove debris such as leaf litter, branches and tree growth from the spreader.
-
- Mowing - Vegetated spreaders may require mowing.
-
- Snow Storage - Do not store snow within the area of the level spreader.
-
- Level Spreader Replacement - The reconstruction of the level spreader may be necessary when sheet flow from the spreader channelize into the buffer.

Disposal

Any sediment or debris removed during maintenance of the stormwater system must be disposed of in accordance with the Maine Solid Waste Disposal Rules.

Recordkeeping

UNE will keep a written maintenance log that summarizes inspections, maintenance, and any corrective actions taken. The log shall 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 sediment or debris, the location where the sediment or debris was disposed after removal will be indicated. This log shall be made available to the Maine Department of Environmental Protection upon request. A copy of this log will be provided to the City of Biddeford Planning Department no later than January 15th of each year.

**UNE Tennis Courts
16 Old Pool Road, Biddeford, ME**

INSPECTION / MAINTENANCE LOG

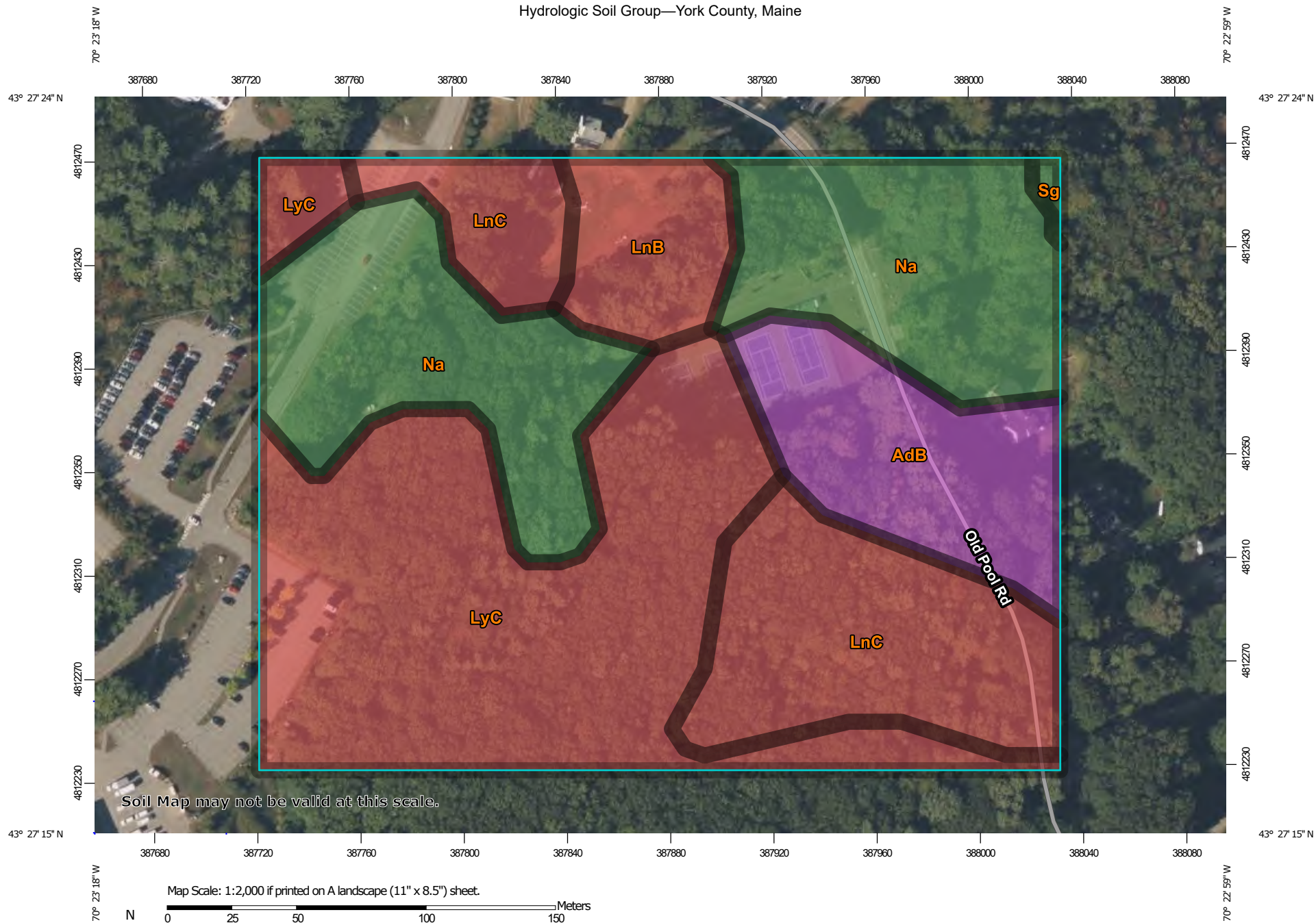
UNDERDRAINED SOIL FILTERS

I: INSPECTED - C: CLEANED - S: SWEEPED - R: REPAIRED

DATE	INITIALS	ACTION	COMMENT
3/28/22	RST	I	EXAMPLE: Cleared sediment and plant debris from inlet area, mowed filter area, crest, and sideslopes.

Appendix E
USDA NRCS Soil Map

Hydrologic Soil Group—York County, Maine



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

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 22, Sep 5, 2023

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

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AdB	Adams loamy sand, 0 to 8 percent slopes	A	2.0	11.2%
LnB	Lyman loam, 3 to 8 percent slopes, rocky	D	1.1	5.9%
LnC	Lyman loam, 8 to 15 percent slopes, rocky	D	3.4	18.4%
LyC	Lyman-Rock outcrop complex, 8 to 15 percent slopes	D	6.6	36.0%
Na	Naumburg sand	A/D	5.1	28.2%
Sg	Sebago peat	A/D	0.1	0.3%
Totals for Area of Interest			18.2	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix F

Drainage Plans

Drawing List

- D-100 – Campus Drainage Plan – Offsite Areas
- D-101 – Campus Drainage Plan – Pre-Development
- D-200 – Campus Drainage Plan – Post Development
- D-300 – Stormwater Treatment Plan

TENNIS COURT EXPANSION

UNIVERSITY OF NEW ENGLAND
16 OLD POOL ROAD
BIDDEFORD, ME

PREPARED FOR:
UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD
BIDDEFORD, ME 04005

FEBRUARY 14, 2024

DESIGN CONSULTANTS

CIVIL ENGINEER
SITE DESIGN ASSOCIATES, INC.
23 WHITNEY WAY
TOPSHAM, ME 04086
207-449-4275

LAND SURVEYOR
OWEN HASKELL, INC.
PROFESSIONAL LAND SURVEYORS
390 US ROUTE 1 - UNIT 10
FALMOUTH, ME 04105
207-774-0424

WETLAND PROFESSIONAL
STATEWIDE SURVEYS, INC.
35 EASTMAN ROAD
CAPE ELIZABETH, ME 04107
207-767-4200

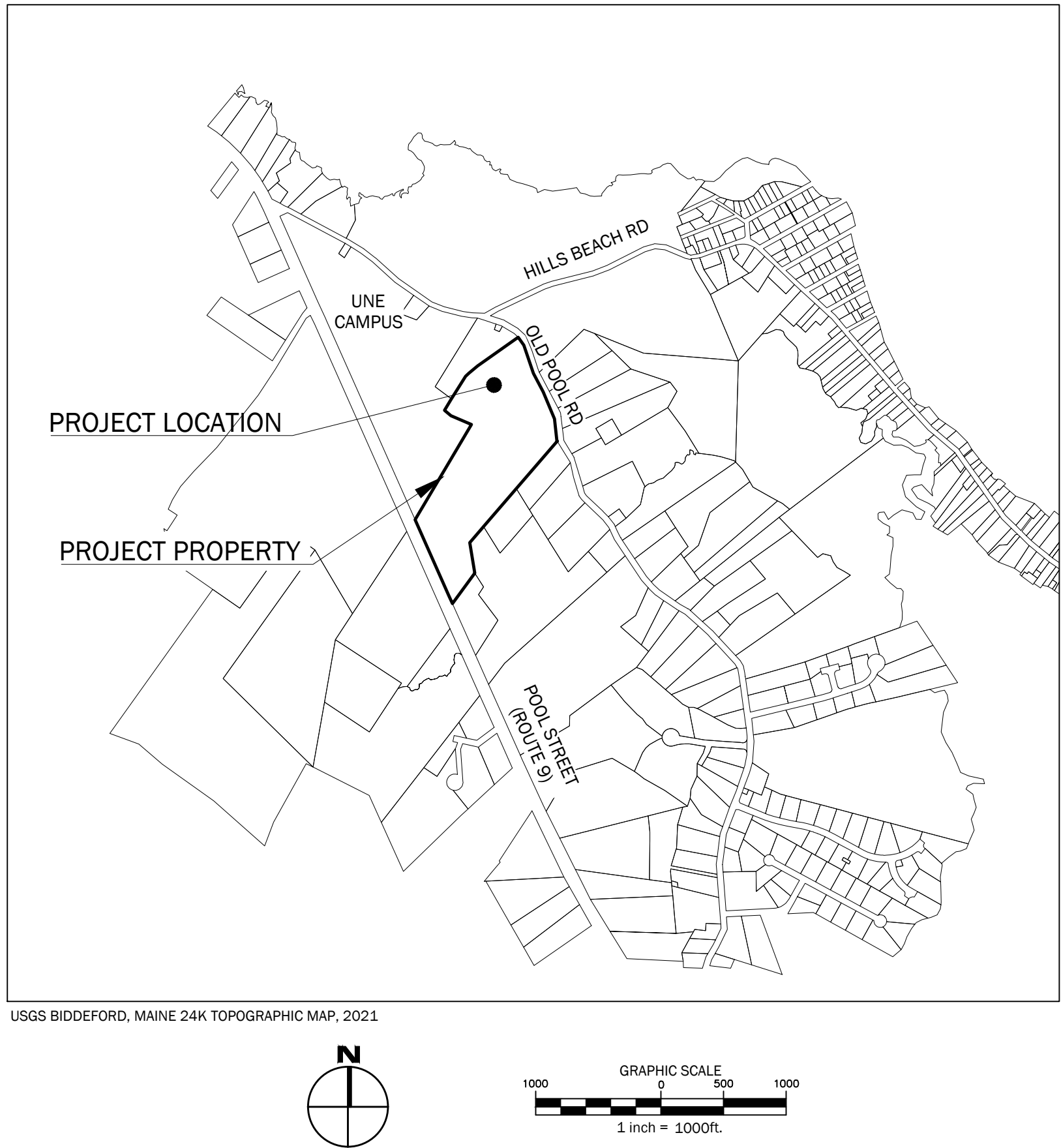
LANDSCAPE ARCHITECT
HUNTRESS SPORTS
LANDSCAPE ARCHITECTS & PLANNERS
17 TEWKSBURY STREET
ANDOVER, MA 01810
978-470-8882

SITE CONTRACTOR
TO BE DETERMINED

Site Design Associates

Consulting Engineering & Land Planning

23 Whitney Way Topsham, Maine 04086 Tel: (207) 449-4275



LIST OF DRAWINGS:

<u>SHEET NO.</u>	<u>SHEET TITLE</u>
	COVER SHEET
C-100	EXISTING CONDITIONS PLAN
C-101	SITE DEMOLITION AND EROSION CONTROL PLAN
C-200	SITE PLAN
C-201	GRADING, DRAINAGE, AND EROSION CONTROL PLAN
E-100	VERNAL POOL CRITICAL TERRESTRIAL HABITAT PLAN
C-301	EROSION & SEDIMENTATION CONTROL NOTES AND DETAILS
C-302	CIVIL DETAILS
C-303	CIVIL DETAILS
L-100	TENNIS COURT DETAILS
L-101	TENNIS COURT DETAILS
L-102	TENNIS COURT DETAILS

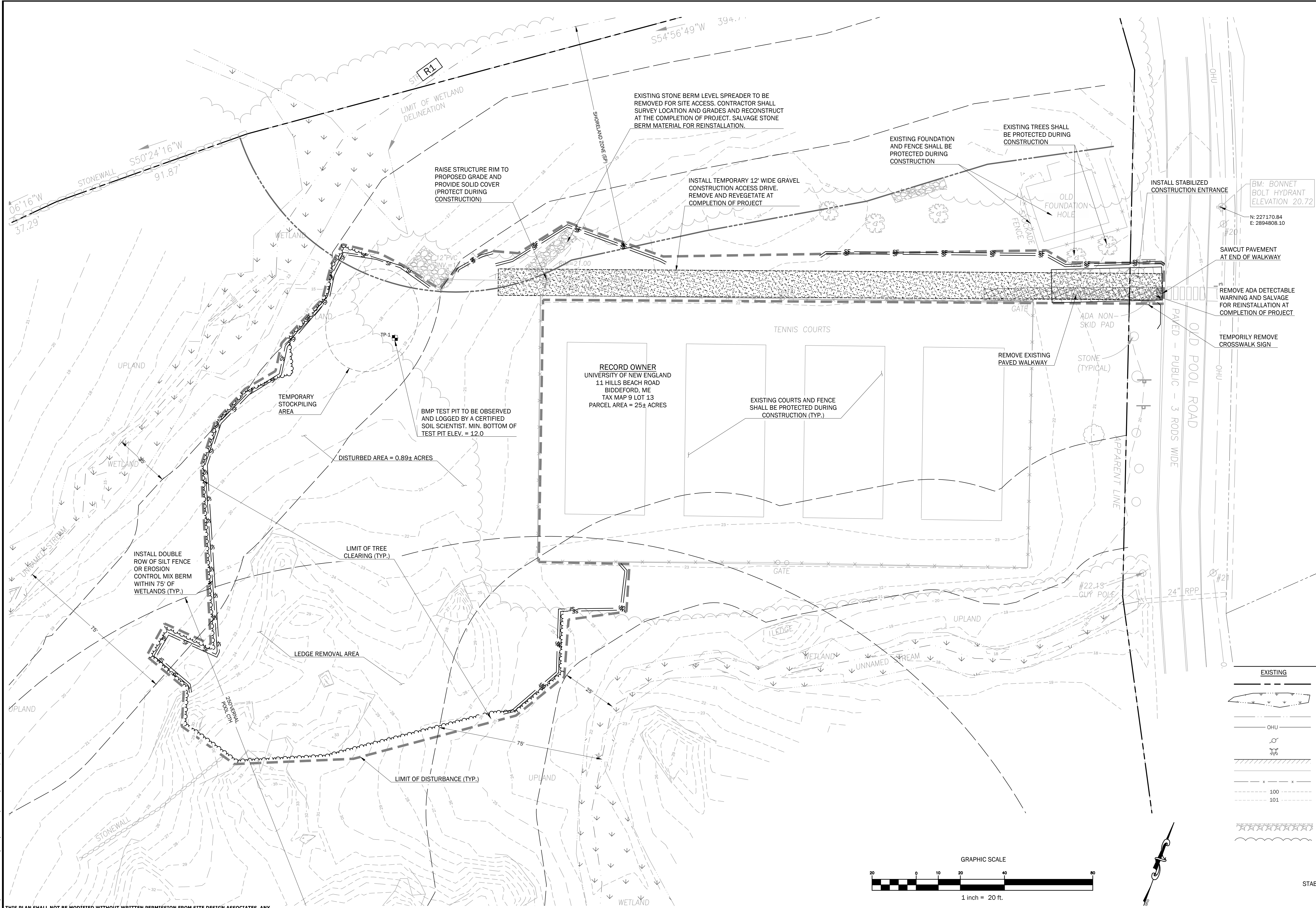
- GENERAL PROJECT NOTES:
- THE PROJECT SITE CONTAINS APPROXIMATELY 25± ACRES.
 - THE PROJECT SITE IS LOCATED IN THE INSTITUTIONAL (IN) ZONE.
 - A NON-STRUCTURAL PORTION OF THE PROJECT IS LOCATED IN THE STREAM PROTECTION (SP) ZONE.
 - THE SITE IS CURRENTLY PART OF THE UNIVERSITY OF NEW ENGLAND CAMPUS AND CONTAINS FOUR TENNIS COURTS. THE REMAINDER OF THE PARCEL IS UNDEVELOPED AND FORESTED.
 - THE PROPOSED PROJECT CONSISTS OF CONSTRUCTION OF TWO ADDITIONAL TENNIS COURTS AND ASSOCIATED AMENITIES.
 - THE PROJECT IS LOCATED IN THE WATERSHED OF AN UNNAMED TRIBUTARY TO BIDDEFORD POOL.
 - THE PROJECT SITE IS NOT LOCATED WITHIN THE BIDDEFORD MS4 URBANIZED AREA.
 - THE FOLLOWING NATURAL RESOURCES ARE LOCATED ONSITE:
 - TWO UNNAMED TRIBUTARY STREAMS TO BIDDEFORD POOL (SEE SHEET C-100).
 - MULTIPLE FRESHWATER WETLANDS ARE LOCATED WITHIN THE PROJECT AREA (SEE SHEET C-100).
 - A SIGNIFICANT VERNAL POOL IS LOCATED IN THE APPROXIMATE CENTER OF THE PROPERTY (SEE SHEET E-100).
 - THE PROJECT IS NOT LOCATED WITHIN THE FEMA 100-YEAR FLOODPLAIN.
 - NO PUBLIC OR PRIVATE ROADS ARE PROPOSED FOR THIS PROJECT.
 - NO PUBLIC SEWER CONNECTIONS ARE PROPOSED FOR THIS PROJECT.
 - NO PUBLIC STORM DRAIN CONNECTIONS ARE PROPOSED FOR THIS PROJECT.
 - THE PROJECT LIMIT OF DISTURBANCE IS APPROXIMATELY 0.89± ACRES.
 - PERVIOUS LAND COVER ONSITE:
EXISTING: 1,061,810 SF
PROPOSED: 1,043,603 SF
 - IMPERVIOUS LAND COVER ONSITE:
EXISTING: 27,190 SF
PROPOSED: 45,397 SF
 - THE FOLLOWING WAIVERS ARE REQUESTED FOR THE PROJECT:
 - WAIVER OF ARTICLE XI.5.B.1.e.3.: NO SLOPES STEEPER THAN 2H:1V. TO ALLOW FOR STEEPER SLOPES IN LEDGE CUT AREAS.

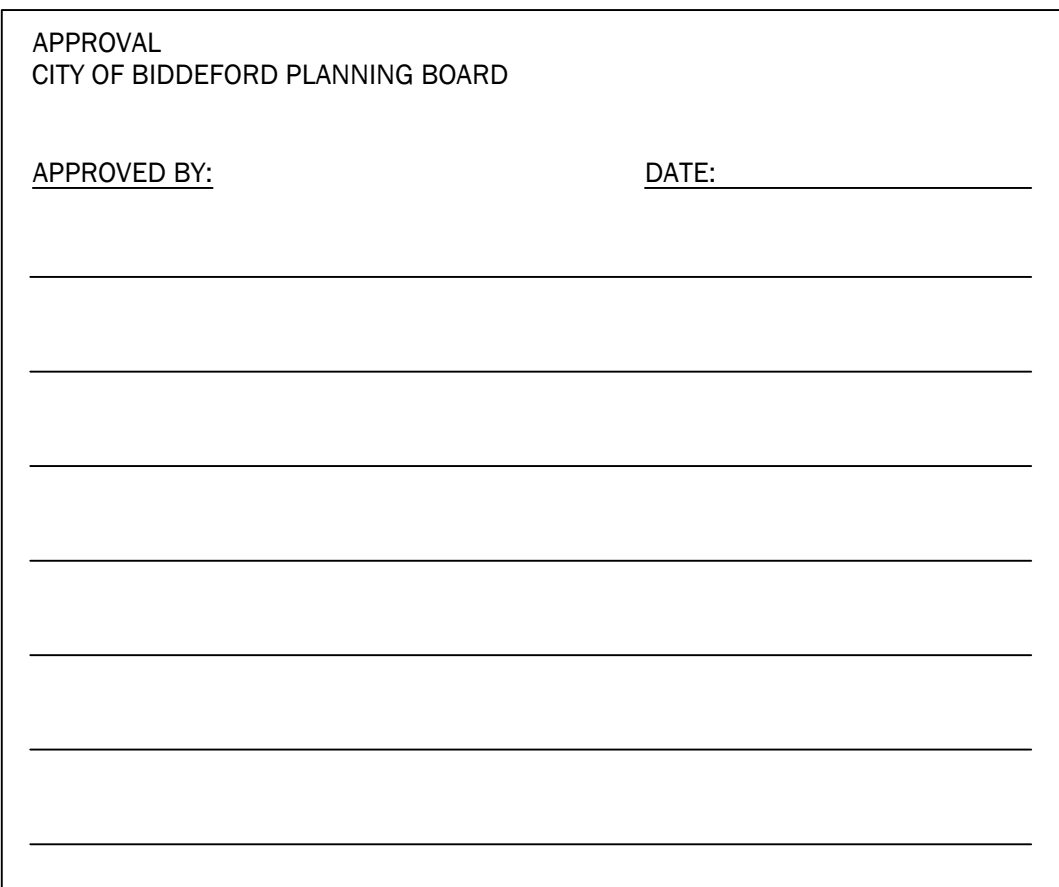
RECORD OWNER:

UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD
BIDDEFORD, ME 04005

PARCEL ID:

TAX MAP 9
LOT 13





THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.

11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

SCALE: 1" =

DWG. NO.	C-200
-------------	-------

1. BOUNDARY AND TOPOGRAPHIC INFORMATION OBTAINED FROM A PLAN ENTITLED "TOPOGRAPHIC SURVEY AT 2 OLD POOL ROAD, BIDDEFORD, ME" PREPARED BY OWEN HASKELL, INC. OF FALMOUTH, MAINE, DATED MAY 24, 2023.
2. WETLANDS WERE DELINEATED IN MAY 2023 BY STATEWIDE SURVEYS, OF CAPE ELIZABETH, MAINE.



THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SITE DESIGN ASSOCIATES, ANY ALTERATIONS, OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SITE DESIGN ASSOCIATES.

[illegible]

Site Design Associates
Consulting Engineering & Land Planning

23 Whitney Way	Topsham, Maine 04086	Tel: (207) 449-4275
CLIENT:		

UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN:	DEPT.
DRAWN:	DEPT.
CHKD:	TWS

DATE: FEB 2024

SCALE: 1" = 40'

PROJECT:	TENNIS COURT EXPANSION
----------	------------------------

16 OLD POOL ROAD, BIDDEFORD, ME

VERNAL POOL CRITICAL TERRESTRIAL
HABITAT PLAN

23-216-00

E-100

PLAN REFERENCES

- 1. BOUNDARY AND TOPOGRAPHIC INFORMATION**
OBTAINED FROM A PLAN ENTITLED "TOPOGRAPHIC
SURVEY AT 2 OLD POOL ROAD, BIDDEFORD, ME"
PREPARED BY OWEN HASKELL, INC. OF FALMOUTH,
MAINE, DATED MAY 24, 2023.
- 2. WETLANDS WERE DELINEATED IN MAY 2023 BY**
STATEWIDE SURVEYS, OF CAPE ELIZABETH, MAINE.



INTRODUCTION

REFERENCE IS MADE TO THE GRADING AND DRAINAGE PLANS (C-301 AND C-302) WITHIN THE PLAN SET, SHOWING THE LOCATIONS AND TYPES OF PROPOSED MEASURES TO BE IMPLEMENTED.

THE FOLLOWING IS A LIST OF GENERAL EROSION CONTROL PRACTICES THAT WILL BE USED TO PREVENT EROSION AND SEDIMENTATION BEFORE, DURING AND AFTER THE CONSTRUCTION OF THIS PROJECT. IN ADDITION, SPECIAL CARE SHALL BE USED AT ALL TIMES TO:

- 1) CORRECT ANY EROSION PROBLEMS IMMEDIATELY
- 2) REGULARLY MONITOR THE IMPLEMENTED PRACTICES, ESPECIALLY AFTER EVERY RAINFALL
- 3) REVEGETATE DISTURBED AREAS AS SOON AS POSSIBLE AFTER CONSTRUCTION
- 4) CONFORM TO ALL REQUIREMENTS/STANDARDS OF THE SITE'S MAINE DEP EROSION & SEDIMENT CONTROL BMP MANUAL.

SILT FENCE AND/OR EROSION CONTROL MIX SEDIMENT BARRIERS WILL BE INSTALLED ALONG THE DOWN GRADIENT SIDE OF THE PROPOSED GROUND DISTURBANCE AREAS PRIOR TO ANY CONSTRUCTION ACTIVITIES WHERE SLOPES EXCEED 8% OR THERE IS FLOWING WATER BOTH SILT FENCE AND EROSION CONTROL MATTING BERM SHALL BE USED.

CATCH BASIN PROTECTION WILL BE INSTALLED AT THE FIRST DOWNGRAIDENT CATCH BASIN IN STREET ADJACENT TO ANY CONSTRUCTION ACTIVITIES AND IN ALL ONSITE CATCH BASINS UNTIL SITE HAS BEEN COMPLETELY STABILIZED.

THE FOLLOWING GENERAL PRACTICES WILL BE IMPLEMENTED TO PREVENT EROSION DURING CONSTRUCTION ON THIS PROJECT:

1. EROSION AND SEDIMENTATION CONTROL BMPs SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF EARTHWORK ACTIVITIES.
2. ONLY THOSE AREAS UNDER ACTIVE CONSTRUCTION WILL BE CLEARED AND LEFT IN AN UNTREATED OR UNVEGETATED CONDITION. AN AREA NO LARGER THAN WHAT CAN BE MULCHED IN ONE DAY MAY BE OPEN AT ONCE. ONCE CONSTRUCTION OF AN AREA IS COMPLETE, FINAL GRADING, LOAMING AND SEEDING SHALL OCCUR IMMEDIATELY (REFER TO "POST CONSTRUCTION REVEGETATION" SECTION). IF DURING FINAL GRADING, LOAMING AND SEEDING CAN NOT OCCUR IMMEDIATELY, IT SHALL BE DONE PRIOR TO ANY STORM EVENT AND WITHIN 15 DAYS OF COMPLETING CONSTRUCTION OF THE AREA. IF FINAL GRADING, LOAMING AND SEEDING CANNOT OCCUR WITHIN 7 DAYS, OR IF THE AREA IS NOT UNDER ACTIVE CONSTRUCTION FOR A PERIOD LONGER THAN 7 DAYS, SEE ITEM NO. 4 BELOW.
3. PRIOR TO THE START OF CONSTRUCTION IN A SPECIFIC AREA, SILT FENCING SHALL BE INSTALLED ON DOWNWIND PORTIONS OF THE SITE AS LOCATED ON THE PLANS TO PROTECT AGAINST ANY CONSTRUCTION RELATED EROSION.
4. TOPSOIL WILL BE STOCKPILED WHEN NECESSARY IN AREAS WHICH HAVE MINIMUM POTENTIAL FOR EROSION AND WILL BE KEPT AS FAR AS POSSIBLE FROM EXISTING DRAINAGE AREAS AND WETLANDS. ALL STOCKPILES EXPECTED TO REMAIN LONGER THAN 7 DAYS SHALL BE:
 - A. TREATED WITH ANCHORED MULCH (WITHIN 5 DAYS OF THE LAST DEPOSIT OF STOCKPILED SOIL).
 - B. SEEDED WITH CONSERVATION MIX AND MULCHED IMMEDIATELY.
 - C. STOCKPILES SHALL BE EITHER PLACED UPHILL OF AN EXISTING SEDIMENT BARRIER ON THE SITE OR ENCLOSED BY A HAY BALE OR SILT FENCE BARRIER THE FIRST DAY THAT STOCKPILING COMMENCES.
5. ALL DISTURBED AREAS EXPECTED TO REMAIN LONGER THAN 7 DAYS SHALL BE:
 - A. TREATED WITH STRAW AT A RATE OF 70-90 LBS. PER 1000 SQUARE FEET FROM 4/16 TO 10/1, OR AT A RATE OF 150-200 LBS. PER 1000 SQUARE FEET FROM 10/1 TO 4/15.
 - B. SEEDED WITH CONSERVATION MIX OF PERENNIAL RYE GRASS (1.0 LBS./1000 SQ.FT.) AND MULCHED IMMEDIATELY. FROM 10/1 TO 4/15 FOLLOW THE SEEDING RATES AS OUTLINED BELOW IN SUB SECTION 4.D. OF THE "POST CONSTRUCTION REVEGETATION" SECTION.
 - C. MONITORED EVERY TWO WEEKS UNTIL SEEDING CAN OCCUR AND REMULCHED AS NEEDED TO PROTECT SLOPES.
6. ALL GRADING WILL BE HELD TO A MAXIMUM 3:1 SLOPE WHERE PRACTICAL. GREATER SLOPES MAY BE USED WHERE THE BANKS ARE PROTECTED WITH SOFT ARMOUR MATING, EROSION CONTROL MATTING, OR RIPRAP. ALL SLOPES WILL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY AFTER FINAL GRADING IS COMPLETE. IT IS UNDERSTOOD THAT IMMEDIATELY MEANS WITHIN 5 DAYS OF THE COMPLETION OF WORK. SEE POST CONSTRUCTION REVEGETATION FOR SEEDING SPECIFICATION).
7. APPLICATION RATE MUST BE 2 BALES (70-90 LBS.) PER 1,000 SQUARE FEET OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75 TO 90% OF THE GROUND SURFACE. DRIVE OVER WITH TRACKED CONSTRUCTION EQUIPMENT ON GRADES OF 5% AND LESS.
8. CONSTRUCTION TRAFFIC WILL BE DIRECTED OVER THE EXISTING SITE ENTRANCE. THE ROAD SHALL BE SWEEPED AND VACUUMED DAILY SHOULD SEDIMENT BE TRACKED ON IT.
9. ALL AREAS DRAINING TO A STORMWATER FILTER OR BMP SHALL BE STABILIZED PRIOR TO CONSTRUCTION OF FILTER MEDIA TO PREVENT SEDIMENT FROM CLOGGING MEDIA.
10. THE UNDERDRAINED SOIL FILTERS WILL BE CONSTRUCTED SIMULTANEOUSLY WITH YOUNG'S LAKE. THE FILTERS WILL BE USED AS TEMPORARY SEDIMENT TRAPS UNTIL THEIR DRAINAGE AREA IS PERMANENTLY STABILIZED.
11. THE AREAS ASSOCIATED WITH THE BUILDING AND DRIVEWAYS CAN BE DISTURBED BY GRUBBING NO EARLIER THAN TWO WEEKS BEFORE THE STARTING DATE OF THEIR CONSTRUCTION.

DEWATERING

1. ALL DEWATERING DISCHARGE LOCATIONS SHALL BE LOCATED ON RELATIVELY FLAT GROUND AT LEAST 75' FROM STREAMS AND 25' FROM WETLANDS. THE CONTRACTOR SHALL UTILIZE DIRT BAGS, EROSION CONTROL MIX BERMS, OR SIMILAR METHODS FOR FILTRATION OF DEWATERING AND SHALL CONFORM TO THE MAINE EROSION AND SEDIMENT CONTROL BMPs G-1, G-2, AND G-3.

THE FOLLOWING GENERAL PRACTICES WILL BE IMPLEMENTED TO PREVENT EROSION AS SOON AS AN AREA IS READY TO UNDERGO FINAL GRADING.

1. A MINIMUM OF 6" OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND GRADED TO A UNIFORM DEPTH AND NATURAL APPEARANCE.
2. LAWN AREAS- "PARK MIX" GRASS SEED BY ALLEN, STERLING & LOTHROP (FALMOUTH, MAINE), OR APPROVED EQUAL.
3. MULCH SHALL BE HAY OR STRAW MULCHES THAT ARE DRY AND FREE FROM UNDESIRABLE SEEDS AND COURSE MATERIALS.
 - A. APPLICATION RATE MUST BE 2 BALES (70-90 LBS.) PER 1,000 SQUARE FEET OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75% TO 90% OF THE GROUND SURFACE.
 - B. DRIVE OVER WITH TRACKED CONSTRUCTION EQUIPMENT ON GRADES OF 5% AND LESS.
 - C. BLANKET WITH TACKED PHOTODEGRADABLE/BIODEGRADABLE NETTING ON GRADES GREATER THAN 5%.
4. HYDRO-MULCH SHALL CONSIST OF A MIXTURE OF ASPHALT, WOOD FIBRE OR PAPER FIBRE AND WATER, WHICH IS SPRAYED OVER A SEEDBED AREA. HYDRO-MULCH SHALL NOT BE USED BETWEEN 10/1 AND 4/15.
5. CONSTRUCTION SHALL BE PLANNED TO ELIMINATE THE NEED FOR SEEDING BETWEEN OCTOBER 1ST AND APRIL 15TH. SHOULD SEEDING BE NECESSARY BETWEEN THESE DATES, THE FOLLOWING PROCEDURE SHALL BE FOLLOWED:
 - A. ONLY UNFROZEN LOAM SHALL BE USED.
 - B. LOAMING, SEEDING AND MULCHING WILL NOT BE DONE OVER SNOW OR ICE COVER. IF SNOW EXISTS, IT MUST BE REMOVED PRIOR TO PLACEMENT OF SEED.
 - C. WHERE PERMANENT SEEDING IS NECESSARY, ANNUAL WINTER RYE (1.2 LBS/1000 S.F.) SHALL BE SOWN INSTEAD OF THE PREVIOUSLY NOTED SEEDING RATE.
 - D. WHERE TEMPORARY SEEDING IS REQUIRED, ANNUAL WINTER RYE (2.5 LBS/1000 S.F.) SHALL BE SOWN INSTEAD OF THE PREVIOUSLY NOTED SEEDING RATE.
 - E. FERTILIZING, SEEDING AND MULCHING SHALL BE DONE ON LOAM THE DAY THE LOAM IS SPREAD.
 - F. HAY MULCH SHALL BE SECURED WITH PHOTODEGRADABLE/BIODEGRADABLE NETTING. TRACKING BY MACHINERY ALONE WILL NOT SUFFICE. WINTER MULCHING RATES, SHALL BE DOUBLE AS SPECIFIED ABOVE IN SUBSECTION 3.A OF THE "POST CONSTRUCTION REVEGETATION" SECTION, SHOULD BE APPLIED DURING THIS PERIOD.
6. FOLLOWING FINAL SEEDING, THE SITE WILL BE INSPECTED EVERY 30 DAYS UNTIL 90% COVER HAS BEEN ESTABLISHED. RESEEDING WILL BE CARRIED OUT BY THE CONTRACTOR WITHIN 10 DAYS OF NOTIFICATION BY THE DESIGN PROFESSIONAL THAT THE EXISTING CATCH IS INADEQUATE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING, MONITORING, MAINTAINING, REPAIRING, REPLACING AND REMOVING ALL OF THE EROSION AND SEDIMENTATION CONTROLS OR APPOINTING A QUALIFIED SUBCONTRACTOR TO DO SO. MAINTENANCE MEASURES WILL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION CYCLE. IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL, AND AT LEAST ONCE A WEEK, A VISUAL INSPECTION WILL BE MADE OF ALL EROSION AND SEDIMENTATION CONTROLS AS FOLLOWS:

1. SILT FENCE SHALL BE INSPECTED AND REPAIRED. SEDIMENT TRAPPED BEHIND THESE BARRIERS SHALL BE EXCAVATED WHEN IT REACHES A DEPTH OF 6" AND REDISTRIBUTED TO AREAS UNDERGOING FINAL GRADING.
2. CONSTRUCTION ENTRANCE SHALL BE VISUALLY INSPECTED AND REPAIRED AS NEEDED. ANY AREAS SUBJECT TO RUTTING SHALL BE STABILIZED IMMEDIATELY. IF THE VOIDS OF THE CONSTRUCTION ENTRANCE BECOME FILLED WITH MUD, MORE CRUSHED STONE SHALL BE ADDED AS NEEDED. THE PUBLIC ROADWAY SHALL BE SWEEP AND VACUUMED SHOULD MUD BE DEPOSITED/TRACKED ONTO THEM.

THE FOLLOWING STANDARDS AND METHODOLOGIES SHALL BE USED FOR STABILIZING THE SITE DURING THE WINTER CONSTRUCTION PERIOD

1. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES (ANY AREA HAVING A GRADE GREATER THAN 25%). THE CONTRACTOR WILL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15TH. IF THE CONTRACTOR FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15TH, THEN THE CONTRACTOR WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR FALL AND WINTER.
- A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS. BY OCTOBER 1ST THE CONTRACTOR WILL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A RATE OF 3 POUNDS PER 1000 SQUARE FEET AND THEN INSTALL EROSION CONTROL MATS OR ANCHORED HAY MULCH OVER THE SEEDING AT TWICE THE RATE AS SPECIFIED ABOVE IN SUBSECTION 3.4 OF THE "POST CONSTRUCTION EROSION CONTROL" SECTION OF THE SPECIFICATIONS. THE CONTRACTOR WILL RESEED AND RECOVER THE NEXT YEAR.
- B. STABILIZE THE SLOPE WITH WOOD-WASTE COMPOST. THE CONTRACTOR WILL PLACE A SIX INCH LAYER OF WOOD-WASTE COMPOST ON THE SLOPE BY NOVEMBER 15TH. THE CONTRACTOR WILL NOT USE WOOD-WASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
- C. STABILIZE THE SLOPE WITH STONE RIPPING. THE CONTRACTOR WILL PLACE A LAYER OF STONE RIPPING ON THE SLOPE BY NOVEMBER

STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOILS - BY SEPTEMBER 15TH THE CONTRACTOR WILL SEED AND MULCH ALL DISTURBED SOILS ON THE SITE. IF THE CONTRACTOR FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE CONTRACTOR WILL TAKE ON OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.

- A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION:** BY OCTOBER 15TH THE CONTRACTOR WILL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET. LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE CONTRACTOR WILL MONITOR GROWTH OF THE RYE OVER THE WINTER MONTHS. IF THE RYE FALLS TO GROW AT LEAST THREE INCHES OR FALLS TO COVER AT LEAST 75% OF THE DISTURBED SOIL BEFORE NOVEMBER 1, THEN THE CONTRACTOR WILL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM 3 OF THIS STANDARD.
- B. STABILIZE THE SOIL WITH SOD:** THE CONTRACTOR WILL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 15TH. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.
- C. STABILIZE THE SOIL WITH MULCH:** BY NOVEMBER 15TH THE CONTRACTOR WILL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 50 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 ANCHOR THE MULCH WITH NETTING OR OTHER METHOD TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.

AN AREA IS CONSIDERED STABLE IF IT IS PAVED OR IF 90% GROWTH OF PLANTED SEEDS IS ESTABLISHED. ONCE AN AREA IS CONSIDERED STABLE, THE EROSION CONTROL MEASURES CAN BE REMOVED AS FOLLOWS:

1. **SILT FENCE:** SILT FENCE SHALL BE DISPOSED OF LEGALLY AND PROPERLY OFF-SITE. ALL SEDIMENT TRAPPED BEHIND THESE CONTROLS SHALL BE DISTRIBUTED TO AN AREA UNDERGOING FINAL GRADING OR REMOVED AND RELOCATED OFF-SITE.
2. **STABILIZED CONSTRUCTION ENTRANCE:** THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE REMOVED ONCE THE COMPACTED ROADWAY BASE IS IN PLACE. STONE AND SEEDMENT FROM THE CONSTRUCTION ENTRANCE SHALL BE REDISTRIBUTED TO AN AREA UNDERGOING GRADING OR REMOVED AND RELOCATED OFFSITE.
3. **MISCELLANEOUS:** ONCE ALL THE TRAPPED SEDIMENTS HAVE BEEN REMOVED FROM THE TEMPORARY SEDIMENTATION DEVICES THE DISTURBED AREAS MUST BE REGRADED IN AN AESTHETIC MANNER TO CONFORM TO THE SURROUNDING TOPOGRAPHY. ONCE GRADED THE DISTURBED AREAS MUST BE LOADED (IF NECESSARY), FERTILIZED, SEEDED AND MULCHED IN ACCORDANCE WITH THE RATES PREVIOUSLY STATED.

THE ABOVE EROSION CONTROLS MUST BE REMOVED WITHIN 30 DAYS OF FINAL STABILIZATION OF THE SITE. CONFORMANCE WITH THIS PLAN AND FOLLOWING THESE PRACTICES WILL RESULT IN A PROJECT THAT COMPLIES WITH THE STATE REGULATIONS AND THE STANDARDS OF THE NATURAL RESOURCES PROTECTION ACT, AND WILL PROTECT WATER QUALITY IN AREAS DOWNSTREAM FROM THE PROJECT.

SUBMISSION OF A MAINE CONSTRUCTION GENERAL PERMIT (MCGP) IS REQUIRED PRIOR TO COMMENCEMENT OF ANY EXCAVATION ACTIVITIES

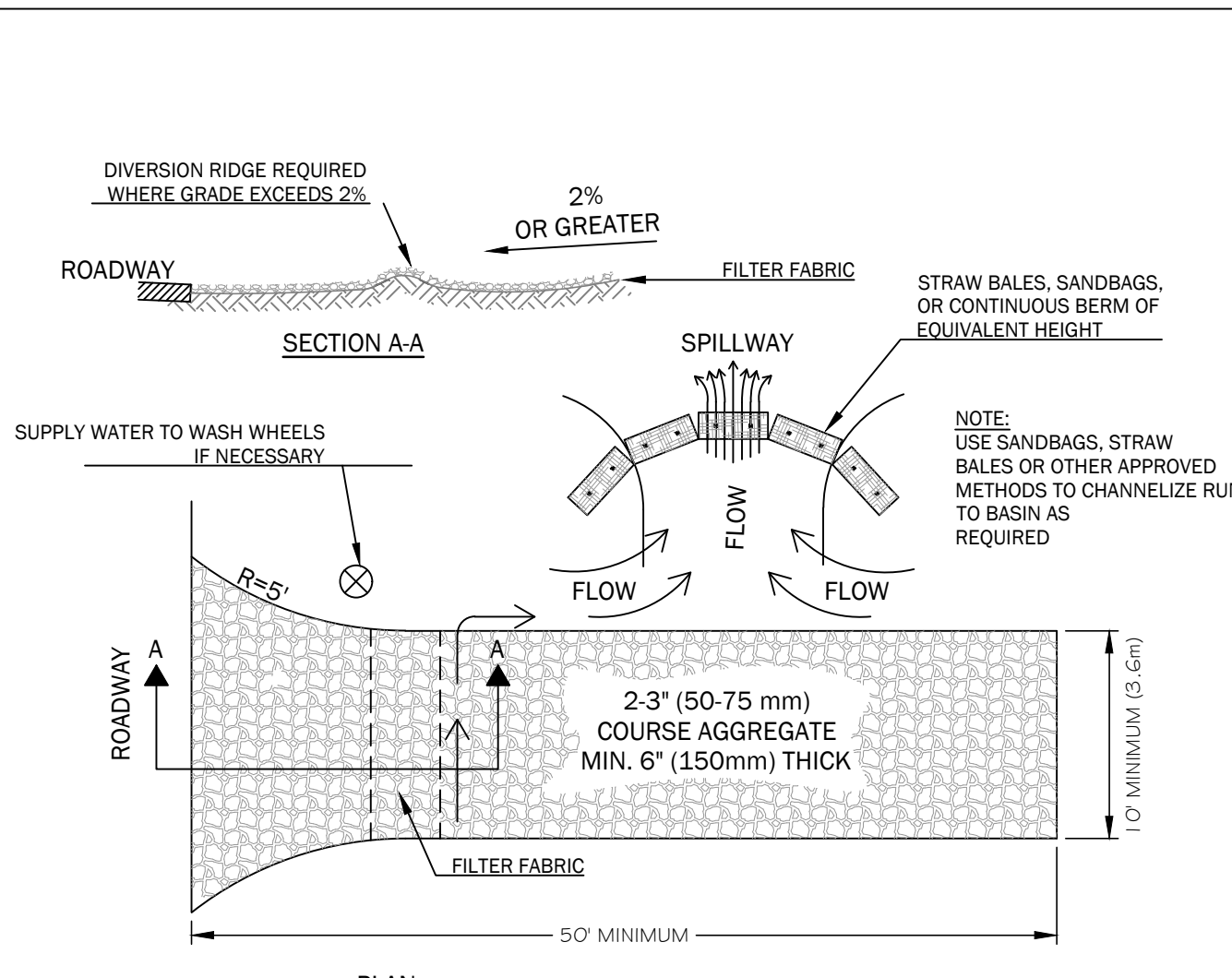
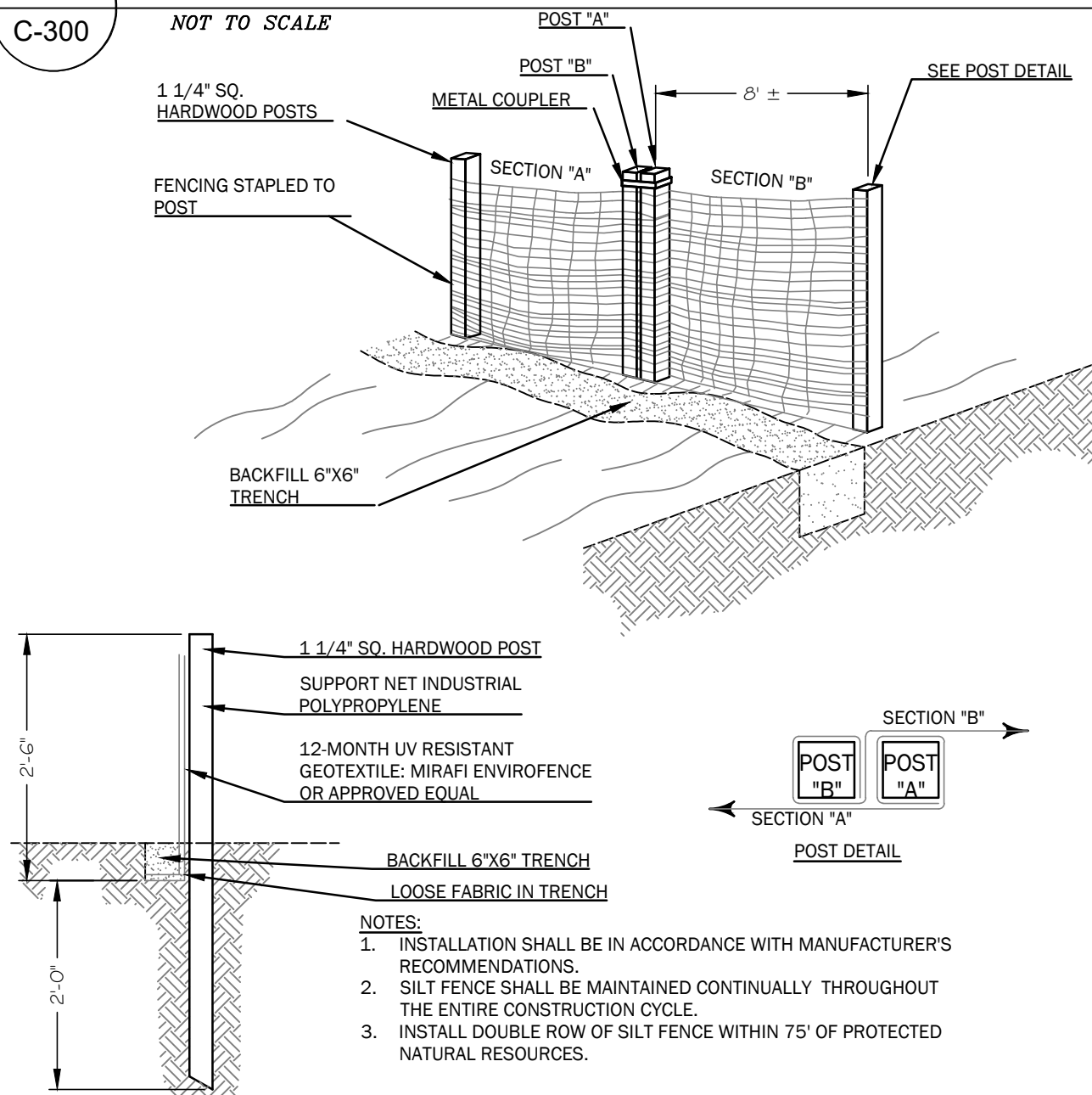
1. **INSPECTION AND MAINTENANCE REQUIREMENTS:** INSPECT DISTURBED AND IMPERVIOUS AREAS, EROSION AND STORMWATER COLLECTION MEASURES, AREAS USED FOR STORAGE THAT ARE EXPOSED TO PRECIPITATION, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE. THESE AREAS AT LEAST ONCE A WEEK AS WELL AS BEFORE AND AFTER A SIGNIFICANT STORM EVENT (0.5 INCHES OF RAINFALL IN A 24 HOUR PERIOD) AND IMMEDIATELY AFTER ANY OTHER SIGNIFICANT WEATHER EVENT. THE INSPECTION SHOULD BE CONDUCTED BY THE STORMWATER CONSULTANT, INCLUDING THE STANDARDS IN THE MCGP AND ANY DEPARTMENTAL COMPLIANCE DOCUMENT TO THE MCGP. MUST CONDUCT THE INSPECTION. THIS PERSON MUST BE IDENTIFIED IN THE INSPECTION LOG. IF BEST MANAGEMENT PRACTICES (BMPs) NEED TO BE MODIFIED OR IF ADDITIONAL BMPs ARE NECESSARY, IMPLEMENTATION MUST BE STARTED BY THE END OF THE NEXT WORKING DAY AND COMPLETED WITHIN 7 CALENDAR DAYS AND PRIOR TO ANY STORM EVENT (RAINFALL). ALL MAINTENANCE MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION UNTIL AREAS ARE PERMANENTLY STABILIZED. DOCUMENTATION OF CORRECTION ACTIONS SHALL BE MAINTAINED WITH THE INSPECTION FORMS.

2. **INSPECTION LOG (REPORT):** A LOG (REPORT) MUST BE KEPT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME(S) AND QUALIFICATIONS OF THE PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTION, AND MAJOR OBSERVATIONS RELATING TO OPERATION OF EROSION AND SEDIMENTATION CONTROLS AND POLLUTION PREVENTION MEASURES. MAJOR OBSERVATIONS MUST INCLUDE BMPs THAT ARE NOT MAINTAINED AS REQUIRED, BMPs THAT ARE NOT MAINTAINED AS DESIGNED, AND ANY OTHER MAJOR OBSERVATIONS. LOCATION(S) WHERE ADDITIONAL BMPs ARE NEEDED, FOR EACH BMP REQUIRING MAINTENANCE, BMP NEEDING REPLACEMENT, AND LOCATION NEEDING ADDITIONAL BMPs, NOTE IN THE INSPECTION LOG THE CORRECT ACTION TAKEN AND WHEN IT WAS TAKEN. THE LOG MUST BE ACCESSIBLE TO THE PUBLIC AT ALL TIMES. THE LOG MUST BE KEPT FOR A PERIOD OF AT LEAST THREE YEARS FROM THE COMPLETION OF THE PERMANENT STABILIZATION.

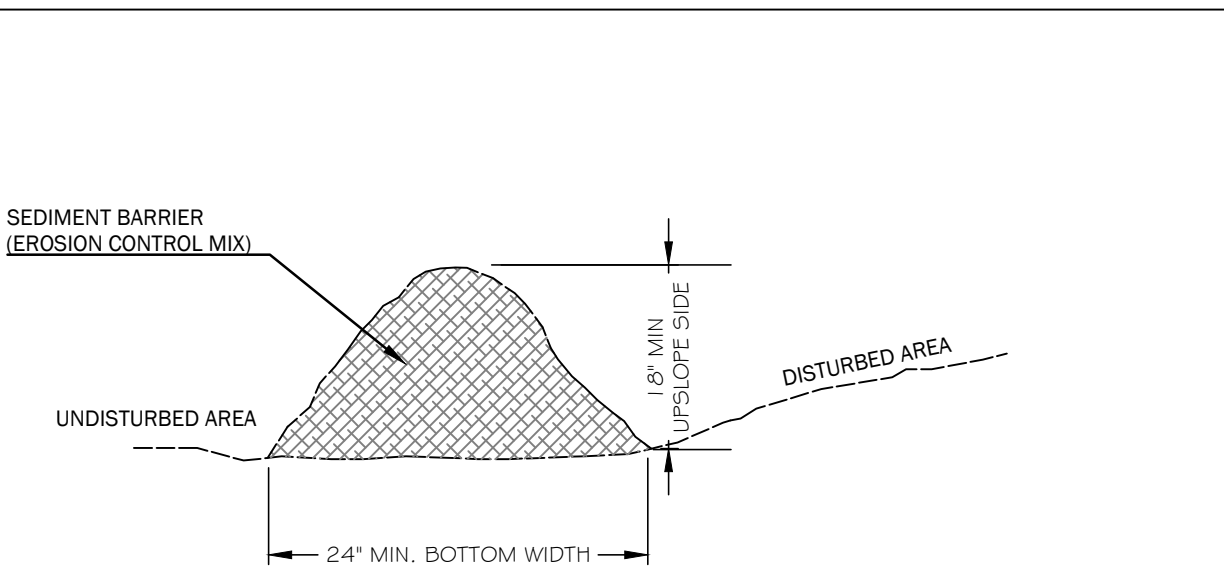
1. **SPILL PREVENTION:** CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM CONSTRUCTION AND WASTE MATERIALS STORED ON SITE TO ENTER STORMWATER, WHICH INCLUDES STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER. THE SITE CONTRACTOR OR OPERATOR MUST DEVELOP, AND IMPLEMENT AS NECESSARY,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

NOTE: ANY SPILL OR RELEASE OF TOXIC OR HAZARDOUS SUBSTANCES MUST BE REPORTED TO THE DEPARTMENT. FOR OIL SPILLS, CALL 1-800-482-0777 WHICH IS AVAILABLE 24 HOURS A DAY. FOR SPILLS OF TOXIC OR HAZARDOUS MATERIAL, CALL 1-800-452-4664 WHICH IS AVAILABLE 24 HOURS A DAY. FOR MORE INFORMATION, VISIT THE DEPARTMENT'S WEBSITE AT: [HTTP://WWW.MAINE.GOV/DEP/SPILLS/EMERGSPILLRESP/](http://www.maine.gov/dep/spills/emergspillresp/)

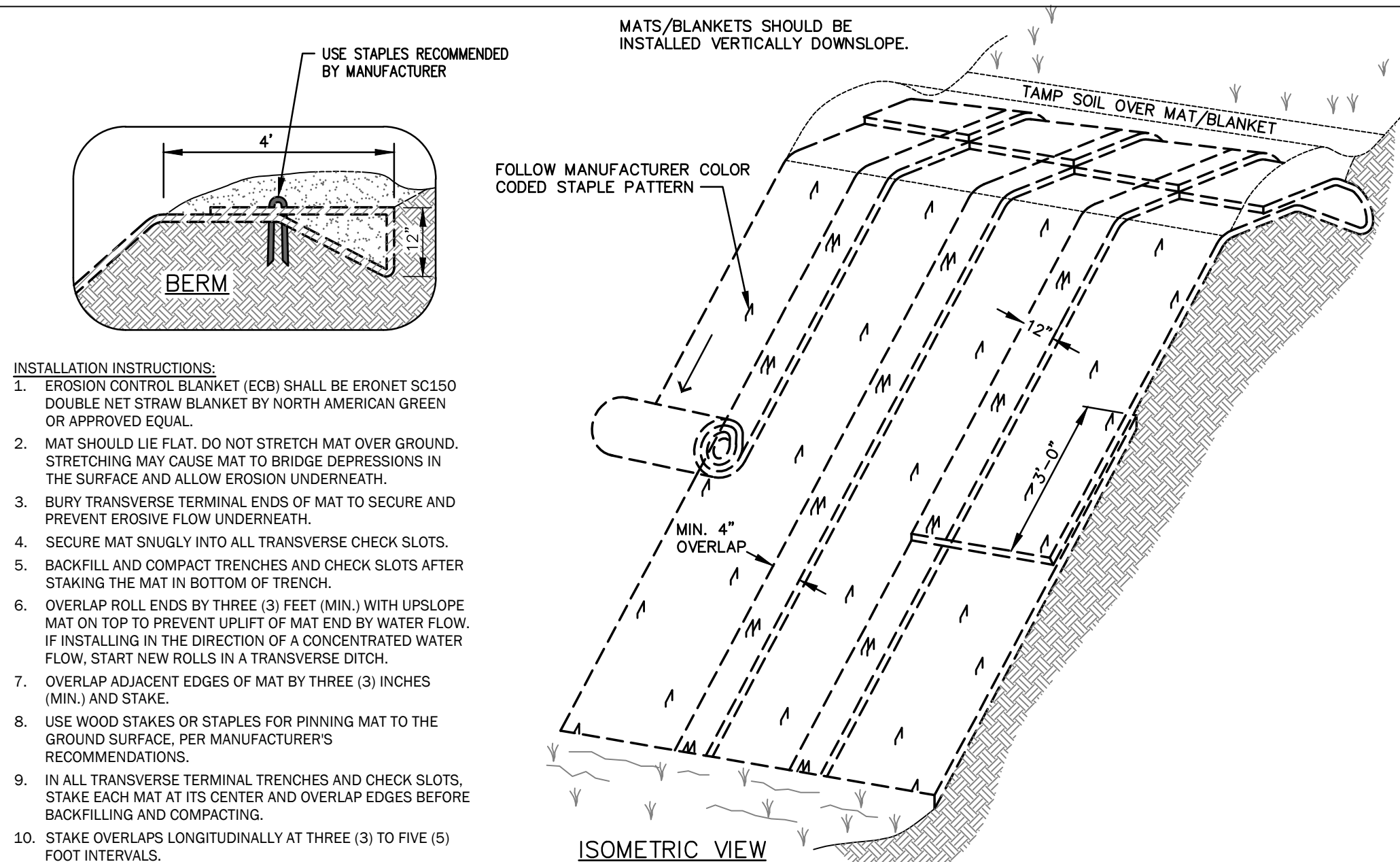
1
C-300



3
C-300



MEASUREMENT



5
C-300

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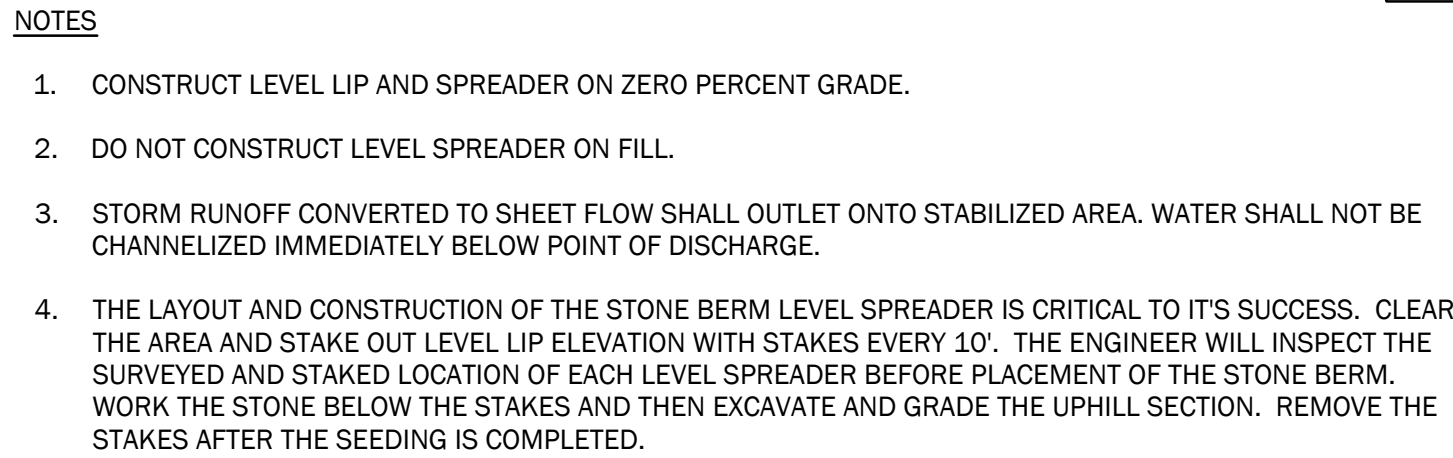
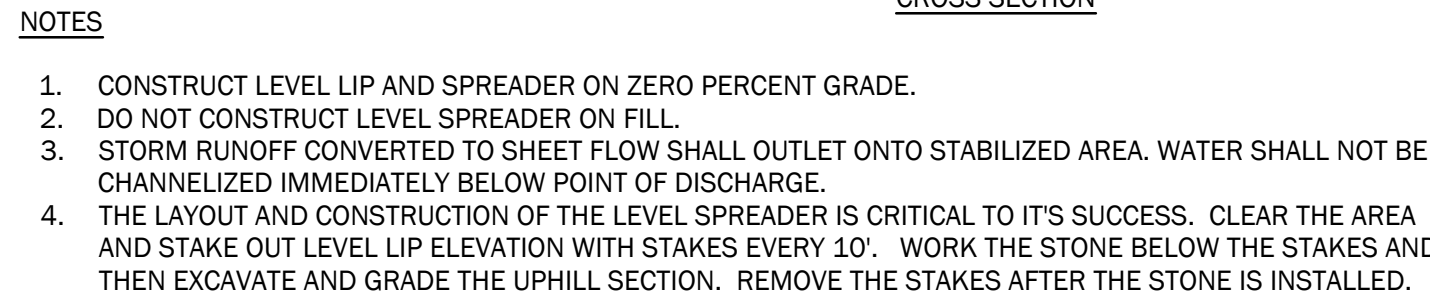
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CLIENT:		

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UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

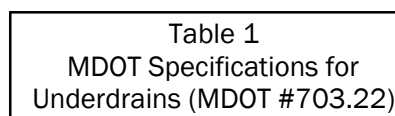
DESIGN: DEPT.	PROJECT: TENNIS COURT EXPANSION		
DRAWN: DEPT.	16 OLD POOL ROAD, BIDDEFORD, ME		
CHKD: TWS	EROSION & SEDIMENTATION CONTROL		
	NOTES AND DETAILS		
DATE: FEB 2024	PROJ. NO.	23-216-00	REV.
SCALE: AS NOTED	DWG. NO.	C-300	A



BERM STONE SIZE	
SIEVE	% BY WEIGHT PASSING SIEVE
12 in	100
6 in	84-100
3 in	68-83
1 in	42-55
No. 4	8-12

C-302 NOT TO SCALE

C-302 NOT TO SCALE



Sieve Size	% by Weight
Underdrain Type B	
1"	90-100
1/2"	75-100
#4	50-100
#20	15-80
#50	0-15
#200	0-5

SOIL FILTER MEDIA NOTES:

SOIL FILTER MEDIA SHALL CONFORM TO MAINE DEP SOIL FILTER MEDIA OPTION 1, PER MAINE DEP STORMWATER BMP MANUAL CHAPTER 7.1. AS FOLLOWS:

- 1.1. SOIL FILTER MEDIA SHALL CONSIST OF A SILTY SAND SOIL OR SOIL MIXTURE COMBINED WITH A MATURE, MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH.
- 1.2. THE RESULTING MIX SHALL CONTAIN NO LESS THAN 10% BY DRY WEIGHT ORGANIC MATERIAL.
- 1.3. THE RESULTING MIX SHALL CONTAIN 8% TO 12% PASSING THE NO. 200 SIEVE.
- 1.4. THE RESULTING MIX SHALL CONTAIN A MAXIMUM CLAY CONTENT OF 2%.

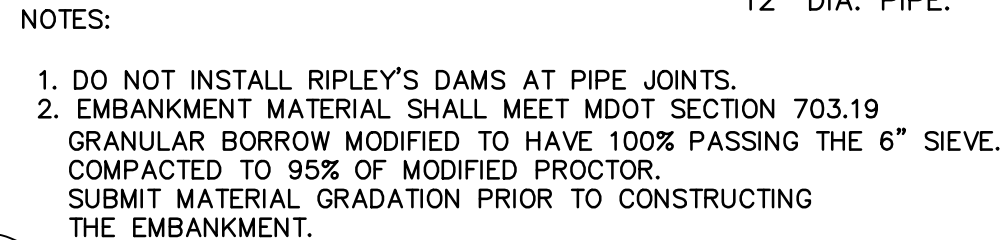
UNDERDRAIN OUTLET VALVE CALIBRATION NOTES:

AFTER THE COMPLETION OF INSTALLATION OF THE SOIL FILTER MEDIA, THE CONTRACTOR SHALL PERFORM THE FOLLOWING PROCEDURE TO CALIBRATE THE UNDERDRAIN OUTLET VALVE TO ACHIEVE THE 0.75"/HOUR DESIGN FLOW RATE.

1. BEGIN WITH VALVE CLOSED.
2. CAREFULLY FLOOD THE BASIN UNTIL THERE IS 15" OF WATER STORED ABOVE THE SOIL FILTER MEDIA (UP TO THE HEIGHT OF OUTLET STRUCTURE RIM) WITHOUT CAUSING EROSION OF THE SOIL FILTER MEDIA.
3. OPEN THE VALVE HALF-WAY.
4. RECORD THE TIME IT TAKES FOR THE 15" OF WATER TO DRAIN TO THE TOP OF THE SOIL FILTER MEDIA. THE TARGET DRAIN TIME IS 6 TO 8 MINUTES.
5. IF THE 15" OF WATER DRAINS IN LESS THAN 24 HOURS, CLOSE THE VALVE SLIGHTLY AND REPEAT STEPS 2 & 3 ABOVE.
6. IF THE 15" OF WATER DRAINS IN MORE THAN 24 HOURS, OPEN THE VALVE SLIGHTLY AND REPEAT STEPS 2 & 3 ABOVE.
7. REPEAT THIS PROCESS UNTIL THE 15" OF WATER DRAINS IN 24 HOURS.

GRASED UNDERDRAIN SOIL FILTER SCHEDULE							
GRASED UNDERDRAIN SOIL FILTER FILTER #	EMBKMT. ELEV. 	SPILLWAY ELEV. 	TOP OF OUTLET STRUCT. ELEV. 	BOTTOM OF STORAGE ELEV. 	INTERIOR UNDERDRAIN INVERT	UNDERDRAIN OUTLET INVERT	FILTER AREA (SQ. FT.)
SF1	20.25	19.00	18.75	17.50	15.17	15.06	971

C-302 NOT TO SCALE



C-302 NOT TO SCALE

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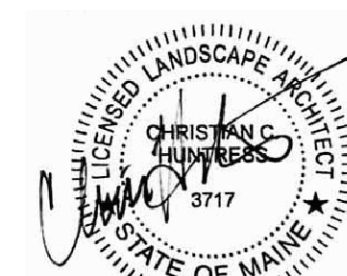
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DRAWN: DEPT.	16 OLD POOL ROAD, BIDDEFORD, ME		
CHKD: TWS	CIVIL DETAILS		
DATE: FEB 2024	PROJ. NO.	23-216-00	REV.
SCALE: AS NOTED	DWG. NO.	C-302	A



I	2/14/24	SUBMITTED FOR SITE PLAN REVIEW						GCH													
REV.	DATE	STATUS						BY	CHKD.	APPD.	REV.	DATE	STATUS						BY	CHKD.	APPD.

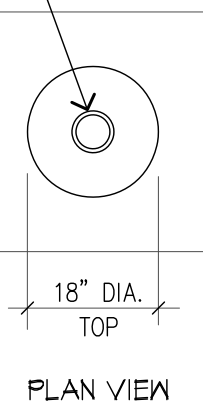


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11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: CCH	PROJECT: TENNIS COURT EXPANSION 16 OLD POOL ROAD, BIDDEFORD, MAINE		
DRAWN: CCH			
CHKD: DPH			
	TENNIS COURT DETAILS		
DATE: 2/14/24	PROJ. NO.	23-216-00	REV.
SCALE: AS NOTED	DWG. NO.	L-100	A



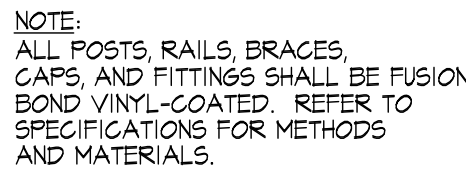
SCALE: 1" = 20'



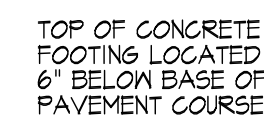
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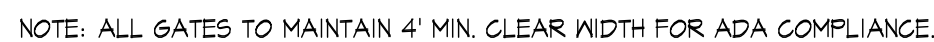
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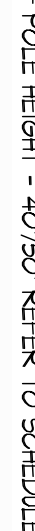
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LANDSCAPE ARCHITECTS & PLANNERS

17 Tewksbury Street - Andover, MA 01810 p 978.470.8882 www.huntressassociates.com

CLIENT: UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: CCH	PROJECT: TENNIS COURT EXPANSION 16 OLD POOL ROAD, BIDDEFORD, MAINE		
DRAWN: CCH			
CHKD: DPH			
	TENNIS COURT DETAILS		
DATE: 2/14/24	PROJ. NO.	23-216-00	REV.
SCALE: AS NOTED	DWG. NO.	L-101	A



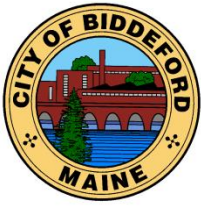
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HUNTRESS *Sports*
LANDSCAPE ARCHITECTS & PLANNERS
17 Tewksbury Street - Andover, MA 01810 p 978.470.8882 www.huntressassociates.com
UNIVERSITY OF NEW ENGLAND
11 HILLS BEACH ROAD BIDDEFORD, MAINE 04005

DESIGN: CCH	PROJECT: TENNIS COURT EXPANSION		
DRAWN: CCH	16 OLD POOL ROAD, BIDDEFORD, MAINE		
CHKD: DPH	TENNIS COURT LIGHTING DETAILS		
DATE: 2/14/24	PROJ. NO.	23-216-00	REV.
SCALE: AS NOTED	DWG. NO.	L-102	A



CITY OF BIDDEFORD

Planning and Development Department

David C.M. Galbraith
Deputy Director/City Planner
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115

David.Galbraith@biddefordmaine.org

PLANNING BOARD STAFF REPORT

TO: Chair Patoine and Members of the Biddeford Planning Board

FROM: David C.M. Galbraith, Deputy Director/City Planner

DATE: May 6, 2024

RE: **2024.25 Shoreland Zoning Permit request for Jonathan & Elizabeth Beebe to remove and reconstruct an existing non-conforming residence with an additional Dwelling Unit (ADU) at 99 Fortunes Rocks Road (Tax Map 65, Lot 2) in the Coastal Residential and Shoreland Overlay Zone.**

MEETING DATE: May 15, 2024 at 6:00 PM

1. INTRODUCTION

The City is in receipt from Jonathan & Elizabeth Beebe who is seeking a Shoreland Zoning Permit for the removal and reconstruction of an existing non-conforming house located at 99 Fortunes Rocks Road.

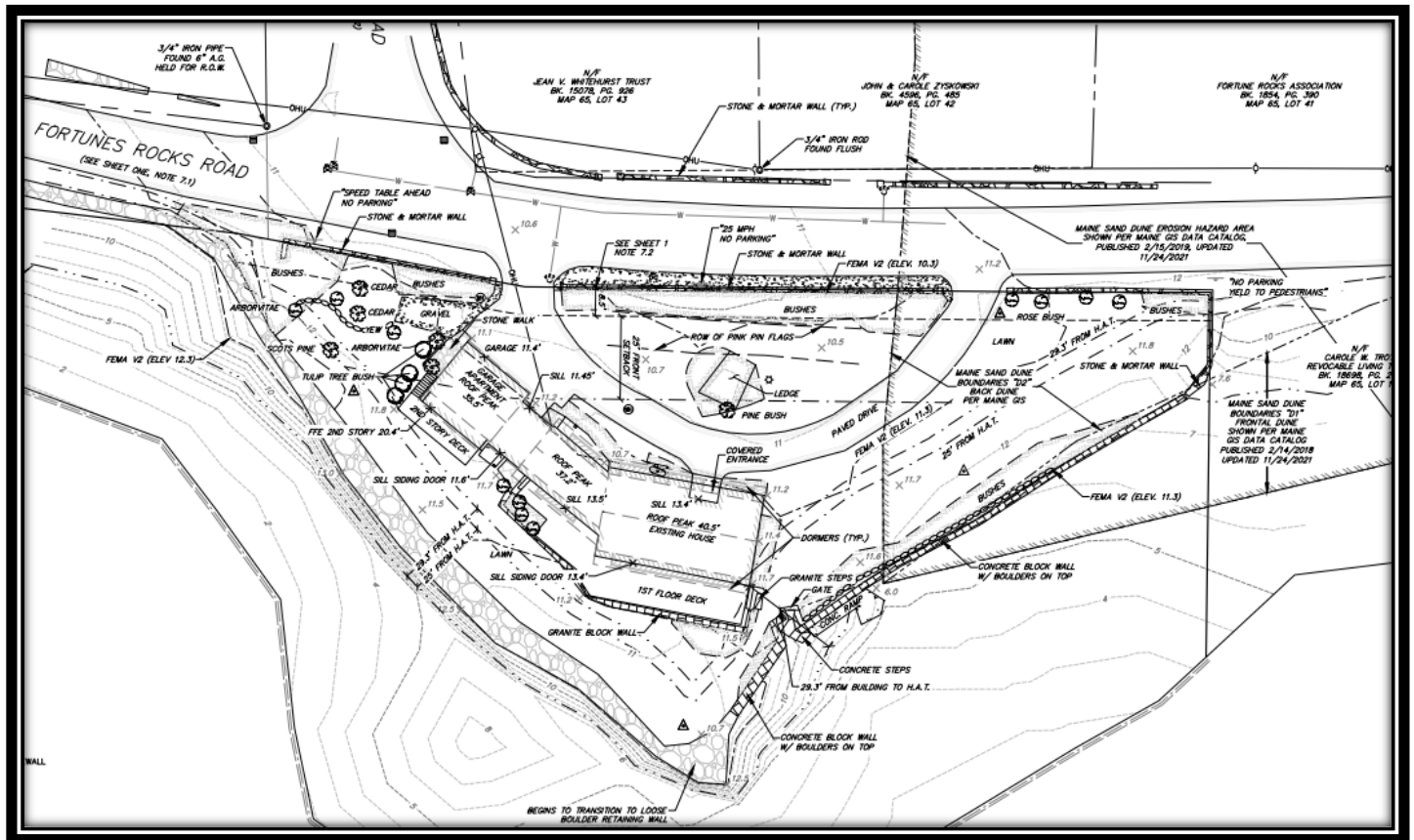


99 Fortunes Rocks Road (Tax Map 65, Lot 2)

2024.25 Shoreland Zoning Permit request for Jonathan & Elizabeth Beebe to remove and reconstruct an existing non-conforming structure with an ADU located at 99 Fortune's Rocks Road (Tax Map 65, Lot 2) / in the Coastal Residential Zone and Shoreland Overlay.

Planning Board Meeting Date: May 15, 2024

The Applicants are being represented by Werner Gilliam, CFM of Walsh Engineering.



99 Fortune's Rocks Road (Tax Map 65, Lot 2) – Existing Conditions and Topography

Project Description:

The applicants purchased the subject property in October 2021. The parcel is developed with a residential dwelling, with attached garage, walkways, customary lawn and landscaped areas, a driveway and ADU. According to City Assessor records, the original structure was constructed in 1920.

The proposed plan is to raze and reconstruct the existing home, moving it towards the street-side setback line to the greatest extent practicable. The driveway and the existing septic system will be replaced in a conforming location. While the current location is identified as a "C" zone on the current regulatory FIRM maps, new preliminary maps show proposed "VE" and "AE" zones affecting the property. In response to the preliminary maps the proposed replacement home will be located outside of the preliminary VE zone, be elevated to meet future elevation requirements, and be constructed to withstand future storm events. In addition, the replacement home will also be placed outside of an adjacent back dune as identified by the most recent version of the coastal sand dune maps. This project is also being reviewed by Maine DEP under their Permit By Rule standards under Section 2, Activity Adjacent to Protected Natural Resource, and Section 20, Activity near Waterfowl /Bird Habitat. A future NRPA application will likely be filed for work along the existing revetment and seawall but is not part of this building reconstruction request.

City Code, Article XIV, Section 12(C) (4), Reconstruction or Replacement:

2024.25 Shoreland Zoning Permit request for Jonathan & Elizabeth Beebe to remove and reconstruct an existing non-conforming structure with an ADU located at 99 Fortune's Rocks Road (Tax Map 65, Lot 2) / in the Coastal Residential Zone and Shoreland Overlay.

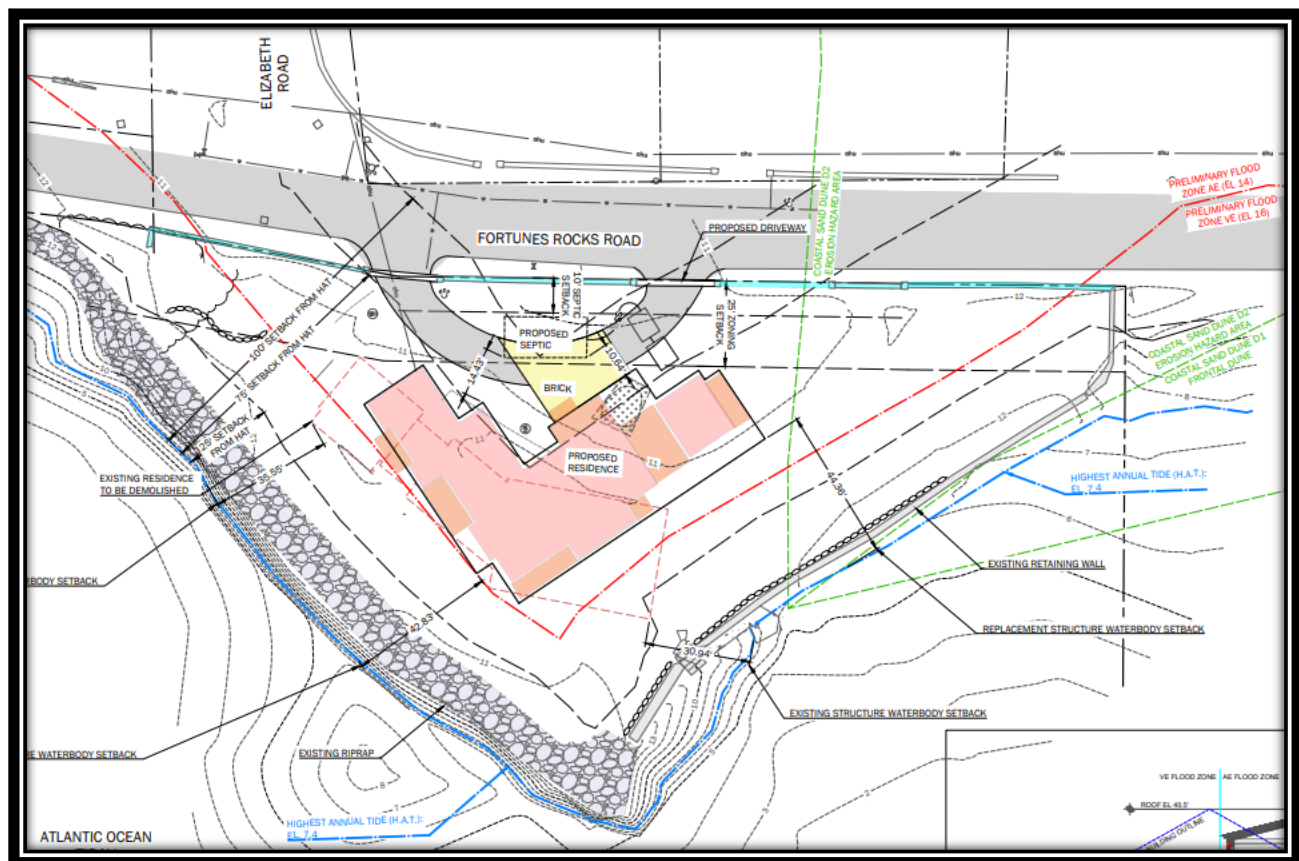
Planning Board Meeting Date: May 15, 2024

The project proposes to remove the existing non-conforming structure and reconstruct it in a more conforming location. Such projects are allowed, subject to City Code, Article XIV, Section 12(C) (4), Reconstruction or Replacement. Specifically, the Code allows the removal and reconstruction of a non-conforming structure within the shoreland zone provided that the structure's footprint is relocated to be in conformity with the shoreline setback to the greatest practical extent, as determined by the Planning Board. Greatest practical extent relocation determination by the Planning Board is the exclusive purpose of this application.

Pursuant to the City's Code, when relocating a non-conforming structure in compliance with the shoreline setback to the greatest practical extent, the Planning Board shall consider 6 specific criteria (see Article XIV, Section 12 (C)(3)). These criteria include, and are limited to the following:

- 1) Size of the lot*
- 2) Slope of the land*
- 3) Potential for soil erosion*
- 4) Location of other structures on the property and on adjacent properties*
- 5) Location of the septic system and other on-site soils suitable for septic systems*
- 6) The type and amount of vegetation to be removed to accomplish the relocation*

The subject lot is 15,246 square feet and approximately 98 feet wide. The existing and proposed structure location are affected by the minimum shoreline setback requirements both from the NHWL as well as by the minimum lot line setback requirements.



99 Fortunes Rocks Road – Proposed House Reconstruction Site Plan – Greatest Practical Extent

2024.25 Shoreland Zoning Permit request for Jonathan & Elizabeth Beebe to remove and reconstruct an existing non-conforming structure with an ADU located at 99 Fortune's Rocks Road (Tax Map 65, Lot 2) / in the Coastal Residential Zone and Shoreland Overlay.

Planning Board Meeting Date: May 15, 2024

Greatest Practical Extent Criteria:

With respect to the 6 relocation criteria outlined in the Code, we provide the following:

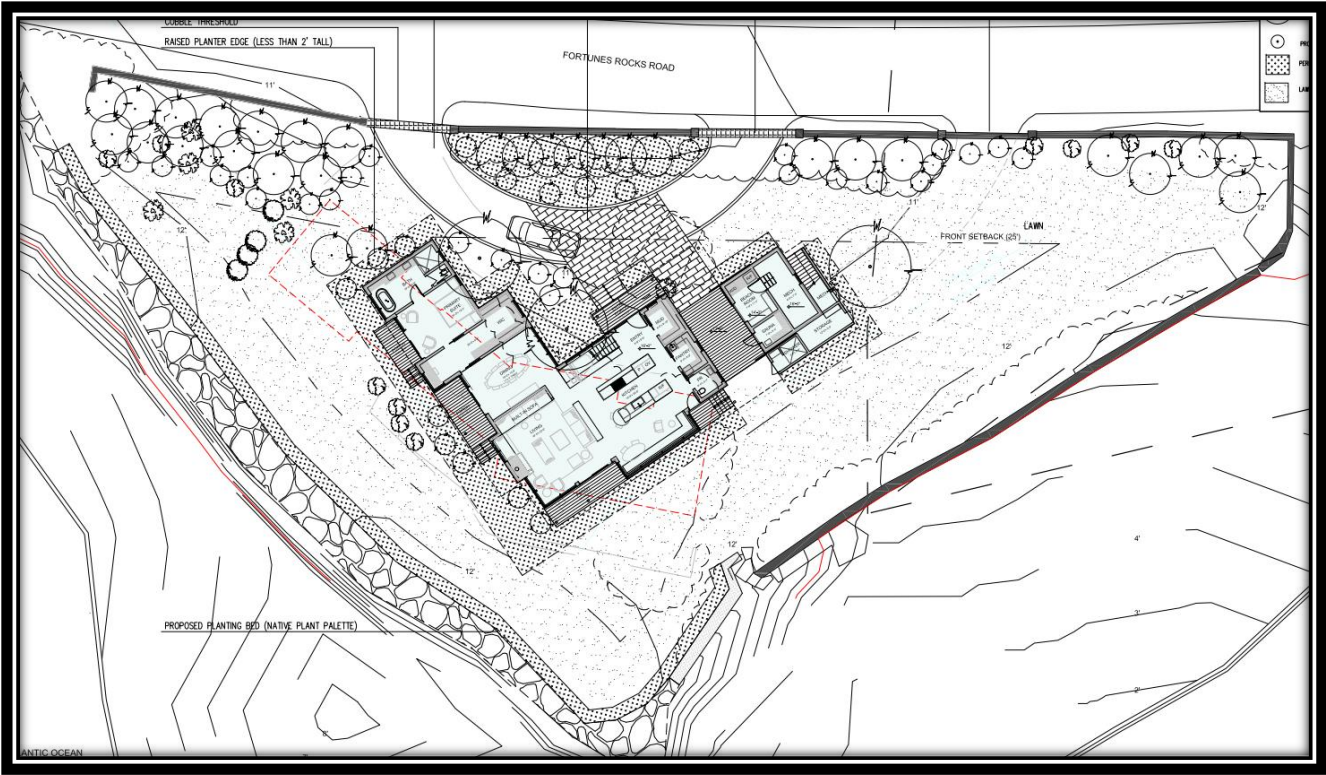
- 1) Size of the lot:*
- 2) Slope of the land:*
- 3) Potential for soil erosion:*
- 4) Location of other structures on the property and on adjacent properties:*
- 5) Location of the septic system and other on-site soils suitable for septic systems: A new subsurface wastewater disposal system will be installed with this project.*
- 6) The type and amount of vegetation to be removed to accomplish the relocation:*

Greatest Practical Extent Criteria:

With respect to the 6 relocation criteria outlined in the Code, we provide the following:

- 1) Size of the lot: The subject property is .35 acres (15,246 +/- sq. ft.), and has multiple minimum setback restrictions, there is a limited location for the structure footprint to be relocated. The applicants have designed the project to meet the intent and purpose of the City's Shoreland Zoning Ordinance.*
- 2) Slope of the land: The slope of the land in the area of the lot that is subject to this proposal is not prohibitive to construction and does not interfere with the structure relocation as proposed.*
- 3) Potential for soil erosion: There are no unique soil conditions or other soil features such that the relocation of the structure footprint would create risk of soil erosion from the lot. The applications has a quite robust re-vegetation plan which will further aid in the prevention of soil erosion.*
- 4) Location of other structures on the property and on adjacent properties: The location of the water line easement limits how far back toward the road the structure can be relocated. There are no other structures that are located on the property that would affect the proposed relocation. There are structures located on the adjacent properties to the north and south, however, the locations of those structures do not limit footprint relocation on the subject lot.*
- 5) Location of the septic system and other on-site soils suitable for septic systems: The proposal includes the replacement of the septic system that will need to be constructed per the State of Maine septic standards.*
- 6) The type and amount of vegetation to be removed to accomplish the relocation: Vegetation removal does not impede structure footprint relocation under the City Code. The existing location from where the structure will be relocated will be replanted with grass vegetation as specified in the Code.*

2024.25 Shoreland Zoning Permit request for Jonathan & Elizabeth Beebe to remove and reconstruct an existing non-conforming structure with an ADU located at 99 Fortune’s Rocks Road (Tax Map 65, Lot 2) / in the Coastal Residential Zone and Shoreland Overlay.
Planning Board Meeting Date: May 15, 2024



99 Fortunes Rocks Road – Proposed House Site and Landscape Plan

Relocation Summary: Due to the relatively small lot size, narrow lot width, minimum setback requirements established in the Code, and as otherwise discussed above, it is our opinion that the proposed footprint relocation of the non-conforming structure establishes the minimum shoreline setback to the greatest practical extent. Accordingly, the applicant respectfully requests the Planning Board’s concurrence that the structure footprint’s greatest practical extent relocation on the lot is 44.38 feet, at the closest point, from the NHWL.

2. PROJECT DATA/INFORMATION

1.	Applicant:	Jonathan & Elizabeth Beebe 99 Fortunes Rocks Road Biddeford, ME 04005
2.	Owner of Property:	Same as Applicant
3.	Agent:	Werner Gilliam, CFM Walsh Engineering Associates, Inc. 1 Karen Drive, Suite 2A Westbrook, ME 04092
4.	Surveyor:	Same as Agent
5.	Project Location:	99 Fortunes Rocks Road
6.	Project Tax Map #/Lot #:	Tax Map 65, Lot 2
7.	Lot Size:	15,246 SF
8.	Base Zoning:	CR
9.	Overlay Zoning:	Shoreland

2024.25 Shoreland Zoning Permit request for Jonathan & Elizabeth Beebe to remove and reconstruct an existing non-conforming structure with an ADU located at 99 Fortune’s Rocks Road (Tax Map 65, Lot 2) / in the Coastal Residential Zone and Shoreland Overlay.

Planning Board Meeting Date: May 15, 2024

10.	Existing Use:	Single Family with ADU
11.	Proposed Use:	Same
12.	Approvals Required:	Shoreland Zoning Permit
13.	Uses in the Vicinity:	Residential
14.	Waivers Needed:	a. None
18.	Waivers Granted:	a. None
22.	Other Non-City Permits Required:	
23.	LDR Attachment A: Fees Paid:	All Paid
25.	Planning Board Review History: Shoreland Zoning Permit 5-15-24	

3. REVIEW PROCESS

Per City ordinance, this application is subject to Shoreland Zoning Permit (Land Development Regulations, Shoreland Zoning Ordinance, Article XIV) review and approval by the Planning Board.

4. STAFF RECOMMENDATION

This application is for removal and reconstruction of an existing non-conforming structure within the shoreland zoning district. Staff is supportive of the proposal as it brings the property into further compliance and as it will reduce a hazardous condition. This proposal has also been discussed with Roby Fecteau, Director of Code Enforcement who is supportive of the applicants request as it meets the purpose and intent of the City’s Shoreland Zoning Ordinance.

5. SAMPLE MOTIONS:

- A. Motion to approve Case # 2024.25 a Shoreland Zoning Permit request for Jonathan & Elizabeth Beebe to remove and reconstruct and existing non-conforming structure located at 99 Fortunes Rocks Road (Tax Map 65, Lot 2) / in the Coastal Residential Zone and Shoreland Overlay.
- B. Motion to Table Case # 2024.25 Shoreland Zoning Permit request for Jonathan & Elizabeth Beebe to remove and reconstruct an existing non-conforming structure located at 99 Fortunes Rocks Road (Tax Map 65, Lot 2) / in the Coastal Residential Zone and Shoreland Overlay, based upon the following reasons:

a)_____

b)_____

c)_____
- C. Motion to Deny Case # 2024.25 Shoreland Zoning Permit request for Jonathan & Elizabeth Beebe to remove and reconstruct an existing non-conforming structure at 99 Fortunes Rocks Road (Tax Map 65, Lot 2) / in the Coastal Residential Zone and Shoreland Overlay, based upon the following reasons:

a)_____

b)_____

c)_____

City of Biddeford Site Plan Application

For

Reconstruction of Existing Single-Family Dwelling
99 Fortunes Rocks Rd
Biddeford, ME 04005

April 12, 2024

Applicant

Johnathan and Elizabeth Bebee
99 Fortunes Roads
Biddeford, ME 04005

Prepared By:

WALSH
ENGINEERING ASSOCIATES, INC.

One Karen Drive, Suite 2A
Westbrook, Maine
207.553.9898

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99 Fortunes Rocks Road Biddeford, ME 04005

Cover Letter
Application Form
Agent Authorization

Attachments:

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Site Plan Application Checklist.....	Attachment 3
Assessment of Compliance with Zoning Standards	Attachment 4
DEP Permit by Rule Application	Attachment 5
Photo Log.....	Attachment 6

Site Plans:

Existing Conditions Plan	C1.0
Proposed Conditions Plan	C2.0
Erosion Control Plan.....	C2.1
Utility Plan	C3.1
Details.....	C3.2
Landscape Plan.....	L1.0
Boundary Survey.....	S2.0

April 11, 2024

City of Biddeford Planning Board
c/o Mr. David Galbraith, Deputy Director of Planning & Development
205 Main Street
Biddeford ME 04005

RE: 99 Fortunes Rocks Rd

Dear Planning Board Members,

On behalf of Jonathan and Elizabeth Bebee (Applicant), Walsh Engineering Associates, Inc. (WEA), is pleased to submit the enclosed Site Plan Application for the proposed reconstruction of a single-family home with accessory apartment located at 99 Fortunes Rocks Road, identified on Biddeford Tax Map 65, Lot 2. The property is located within the Limited Residential Overlay, and Shoreland Overlay Zone.

Existing Conditions

The project area is located on a parcel of land off Fortunes Rocks Road in Biddeford and directly abuts the Atlantic Ocean along the easterly property boundary. The lot is fully developed with lawn, driveway, single family home with apartment and a combination of seawalls and rip rap revetment. The home in its current location is vulnerable to coastal storms and has experienced damage from cobbles being thrown over the revetment against it.

Proposed Development

The proposed plan is to raze and reconstruct the existing home, moving it towards the streetside setback line to the greatest extent practicable. The driveway and the existing septic system will be replaced in a conforming location. While the current location is identified as a “C” zone on the current regulatory FIRM maps, new preliminary maps show proposed “VE” and “AE” zones affecting the property. In response to the preliminary maps the proposed replacement home will be located outside of the preliminary VE zone, be elevated to meet future elevation requirements, and be constructed to withstand future storm events. In addition, the replacement home will also be placed outside of an adjacent back dune as identified by the most recent version of the coastal sand dune maps. This project is also being reviewed by Maine DEP under their Permit By Rule standards under Section 2, *Activity Adjacent to Protected Natural Resource*, and Section 20, *Activity near Waterfowl /Bird Habitat*. A future NRPA application will likely be filed for work along the existing revetment and seawall but is not part of this building reconstruction request.

	Existing	Proposed
Lot Area(Not including ledge areas, beach etc.)	28,225	28,225
Building (including decks and steps)	3,622	4,014
Pavement	2,558	835
Gravel	234	0
Concrete	139	0
Brick (Not including portion covered by building overhang)	114	479
Non-retaining walls	359	348
Future Rip rap for stabilization over existing lawn		1,350
Total impervious	7,026	7,026
Lot coverage %	24.89%	24.89%

* Existing rip rap and retaining wall are over existing ledge

Respectfully,

Werner Gilliam

Werner Gilliam, CFM
Walsh Engineering Associates, Inc.

cc. Jonathan and Elizabeth Bebee

Enc. Site Plan Application & Supporting Documents
Plan Set:

- C1.0 Existing Conditions
- C2.0 Proposed Conditions
- C2.1 Erosion Control
- C3.1 Utility Plan
- C3.2 Details
- L1.0 Landscape Plan
- S2.0 Boundary Survey

**City of Biddeford – Planning Department****Planning Board Application**

P.O. Box 586, 205 Main Street Biddeford, Maine 04005
207-284-9115

Type of Application:

☒ Shoreland Zoning Permit ☐ Site Plan Review ☐ Extraction
☐ Conditional Use Permit ☐ Subdivision ☐ Private Way
☐ Other: _____

Applicant Information:

Name: Jonathan and Elizabeth Bebee _____
Mailing Address: 99 Fortunes Rock Road Biddeford, Maine 04005 _____
Telephone: (978)792-4677 _____
Email: jonbeebe1@gmail.com _____

What is your legal interest in the property?

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

Owner's Information:

Name: ☐ Jonathan and Elizabeth Bebee _____
Mailing Address: 99 Fortunes Rock Road Biddeford, Maine 04005 _____
Telephone: (978)792-4677 _____
Email: ☐ jonbeebe1@gmail.com _____

Agent's Information:

Name: ☐ Walsh Engineering _____
Mailing Address: 1 Karen Drive Suite 2A Westbrook, ME 04092 _____
Telephone: (207)553-9898 _____
Email: werner@walsh-eng.com _____

Engineer/Surveyor's Information:

Name: ☐ William Walsh _____
Mailing Address: ☐ 1 Karen Drive Suite 2A Westbrook Me 04092 _____
Telephone: (207)553-9898 _____
Email: bill@walsh-eng.com _____

Project Location and Lot Information:

Street Address: 99 Fortunes Rocks Rd _____ **Drainage Watershed:** Saco Bay
Tax Map: 65 _____ **Lot:** 2 _____
Current Zoning: ☐ Coastal Residential _____ **Shoreland Zoning:** ☐ Shoreland Overlay _____
Size of Lot: 1.4 _____ (☒) acres () s.f. Lot Frontage: 1,004' per survey _____
Existing Use of Property: ☐ Existing Single family home with Accessory Apartment _____

Property currently serviced by:

☒ City Road ☐ Public Sewer ☒ Public Water ☒ Public Trash
☐ Private Road ☒ Septic System ☐ Private Well ☐ 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

Is the project within the 100-year floodplain? ☒ (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:

Replacement of existing Non-Conforming Single Family Home with Accessory apartment

Replacement to greatest practical extent

Property to be Serviced by:

☒ City Road ☐ Public Sewer ☒ Public Water ☒ Public Trash

☐ Private Road ☒ Septic System ☐ Private Well ☐ Private Hauler

Limits of Disturbance: 13,000 +/- _____ (☐)acres (☒)s.f.

Net change in impervious cover: No Change _____ (☐)acres (☐)s.f.

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

Is the project proposing a new Private or Public Road? ☐ (Yes, Private) ☐ (Yes, Public) ☒ (No)

Is this project within the Urbanized Area/MS4 (see [City Drainage Map](#)) ☐ (Yes) ☒ (No)

Is the project proposing any Stormwater facilities/BMPs? ☐ (Yes) ☒ (No)

Will a Traffic Movement Permit (TMP) be required?: ☐ (Yes) ☒ (No)

☒ **If in a Shoreland Zone:**

Percent of residential lot coverage (Max 20%): 24.89% Pre-existing

Percent of structure expansion (Max 30%): 10.8%

☐ **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 structure: 392

Total new square feet paving/parking: Overall reduction

Waiver Requests (attach details):

1. _____
2. _____
3. _____
4. _____
5. _____

Required Submittal 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 Department – 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. Engineering Plans, as required.

F. Stormwater Management Report, as required.

Fees (Due at time of Submission):

- \$75 Nonrefundable Administration Fee is required for every 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 its 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 the review for special studies, legal review costs, and/or engineering review.
- I understand that by submitting an 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.

Will the proposed project cause 1 acre or more of site disturbance?: __ (Yes) X (No)

- **If Yes, applicant is responsible for any required Maine Construction General Permits and shall comply with the requirements of DEP Chapter 500 Stormwater Regulations, as they apply.**

Signature of Applicant: **Werner Gilliam**

Date 4/9/2024

Signature of Property Owner: _____

Date _____

DIGITAL SUBMITTAL REQUIREMENTS FOR ALL SUBMITTALS:

A) PDF OF SIGNED APPLICATION

B) PDFs OF ALL DRAWING SETS AND OTHER REQUIRED SUBMITTAL ATTACHMENTS NOTED ABOVE

HARD-COPY SUBMITTAL REQUIREMENTS FOR PLANNING BOARD APPLICATIONS:

A) SEVEN (7) FULL-SIZE PAPER COPIES OF DRAWING SETS

DIGITAL SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

A) INDIVIDUALLY NAMED PDFs OF EACH DRAWING (NOT A COMBINED PDF SET)

- *Individual Drawing PDF Naming Format: 'PROJECT/SHEETSET NAME_INDIVIDUAL DRAWING NAME.pdf'*

B) PDF COPIES OF ALL PERMIT APPROVALS, APPLICATIONS, REPORTS, NARRATIVES, LETTERS, ETC.

C) FINAL CAD REFERENCE FILES IN DWG FORMAT (SURVEY & PROPOSED DESIGN LINEWORK)

- *All drawings & CAD reference files must be to-scale and within the following coordinate systems:*

- *MAINE STATE PLANE WEST NAD83 (Horizontal Datum) & NAVD88 (Vertical Datum)*

HARD-COPY SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

A) THREE (3) FULL-SIZE PAPER COPIES OF INDIVIDUAL DRAWINGS REQUIRING BOARD SIGNATURE

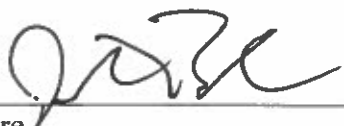
B) ONE (1) FULL-SIZE PAPER COPY OF ENTIRE DRAWING SET FOR ENGINEERING RECORDS

PLEASE CONFIRM WITH PLANNING STAFF FOR CLARIFICATION

To Whom It May Concern,

By this letter, the undersigned, a representative of (**Jonathan and Elizabeth Beebe applicant**) authorizes Walsh Engineering Associates, Inc. to act as the agent for the undersigned in the preparation and submission of all Federal, State, and Local City permit applications and relevant documents and correspondence for all necessary permits for the construction/reconstruction of the property at (**99 Fortunes Rocks City of Biddeford Maine**); to attend meetings and site visits; to appear before all boards, commissions, and committees, and to provide such other services as are necessary and appropriate in furtherance of the aforementioned project.

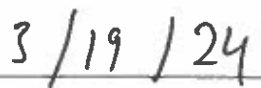
Sincerely,



Signature



Printed Name and Title



Date

Attachment 1:

Deed

-YCRD BK 18837 PG 185

TRUSTEE'S DEED
(Maine Statutory Short Form)

DLN: 1002140166870

KNOW ALL BY THESE PRESENTS, That I, **Carole W. Troy, Trustee of the Carole W. Troy Revocable Living Trust**, whose mailing address is **148 Breakwater Drive, Unit 707, South Portland, ME 04106**, by the power conferred by law, and every other power, and for consideration paid, grant to **Jonathan Beebe and Elizabeth Beebe** whose mailing address is **7638 Pine Tree Drive, Victor, NY 14564** as JOINT TENANTS, with **QUITCLAIM COVENANT**, all of the right, title, and interest vested in the trust in and to the real property in the City of **Biddeford**, County of **York** and State of **Maine**, described as follows:

A certain lot or parcel of land, with the buildings thereon, situated at **Fortunes Rocks**, so-called, in **Biddeford**, County of **York** and State of **Maine**, southeasterly of the travelled road from **Fortunes Rocks** to **Biddeford Pool**, commonly known as the **King's Highway** and now known as **99 Fortunes Rocks Road**, and being more particularly bounded and described as follows:

Beginning on the southeasterly side of said travelled road at the point of intersection of the southeasterly side of said road and the prolongation, if extended southeasterly, of the southwesterly sideline of the road called **Elizabeth Road**; thence from said point of beginning in a northeasterly direction by said travelled road from **Fortunes Rocks** to **Biddeford Pool** about two hundred eighty (280) feet to a point coincident with a stone wall perpendicular to said travelled road; thence at nearly right angles with said travelled road in a southeasterly direction by said stone wall to the top of the bank of the **Atlantic Ocean**; thence on the same course to the **Ocean**; thence generally in a southwesterly direction by said **Ocean** to the point in the prolongation, if extended southeasterly, of a line ten (10) feet northeasterly of and parallel to the northeasterly boundary line of lot numbered thirty-one (31) on Plan of **Warren C. Bryant** property, recorded in the **York County Registry of Deeds**, Book of Plans 6, Page 31; thence in a northwesterly direction by the prolongation of said line which is parallel to and ten (10) feet distant from the northeasterly boundary line of said lot numbered thirty-one (31), to the said travelled road from **Fortunes Rocks** to **Biddeford Pool**; thence in a northeasterly direction by said travelled road to the point of beginning.

Meaning and intending to convey and conveying the real property described in a deed to **Carole W. Troy, Trustee of the Carole W. Troy Revocable Living Trust** dated June, 2014, acknowledged June 14, 2021 and recorded with the **York County Registry of Deeds** in Book 18698, Page 261

Certification of Trust

Pursuant to 18-B MRSA §1013, now comes, **Carole W. Troy, Trustee of the Carole W. Troy Revocable Living Trust**, hereinafter "Trust", and under oath, certifies the following as true:

1. The Trust was executed and remains in full force and effect and has not been revoked, terminated, modified or amended in any manner that would cause the representations contained in this certification of trust to be incorrect;
2. I am the sole current Trustee in charge of said Trust;
3. Under the terms of the Trust, I am vested with the full power and authority to transact all business related to Trust property;

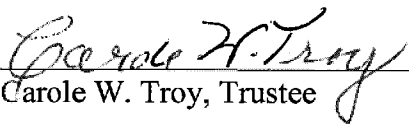
Maine R.E. Transfer Tax Paid

4. In particular, I am authorized under the terms of the Trust to execute and deliver this Deed in the City of Biddeford, County of York and State of Maine and to direct disposition of sale proceeds, and to authorize an agent to act on my behalf during the closing if I so choose.

WITNESS my hand and seal this 14th day of October, 2021.


Witness

Carole W. Troy Revocable Living Trust

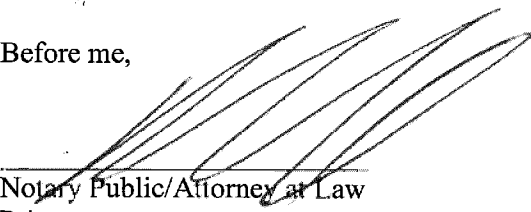
By: 
Carole W. Troy, Trustee

STATE OF MAINE
COUNTY OF CUMBERLAND, ss.

October 14, 2021

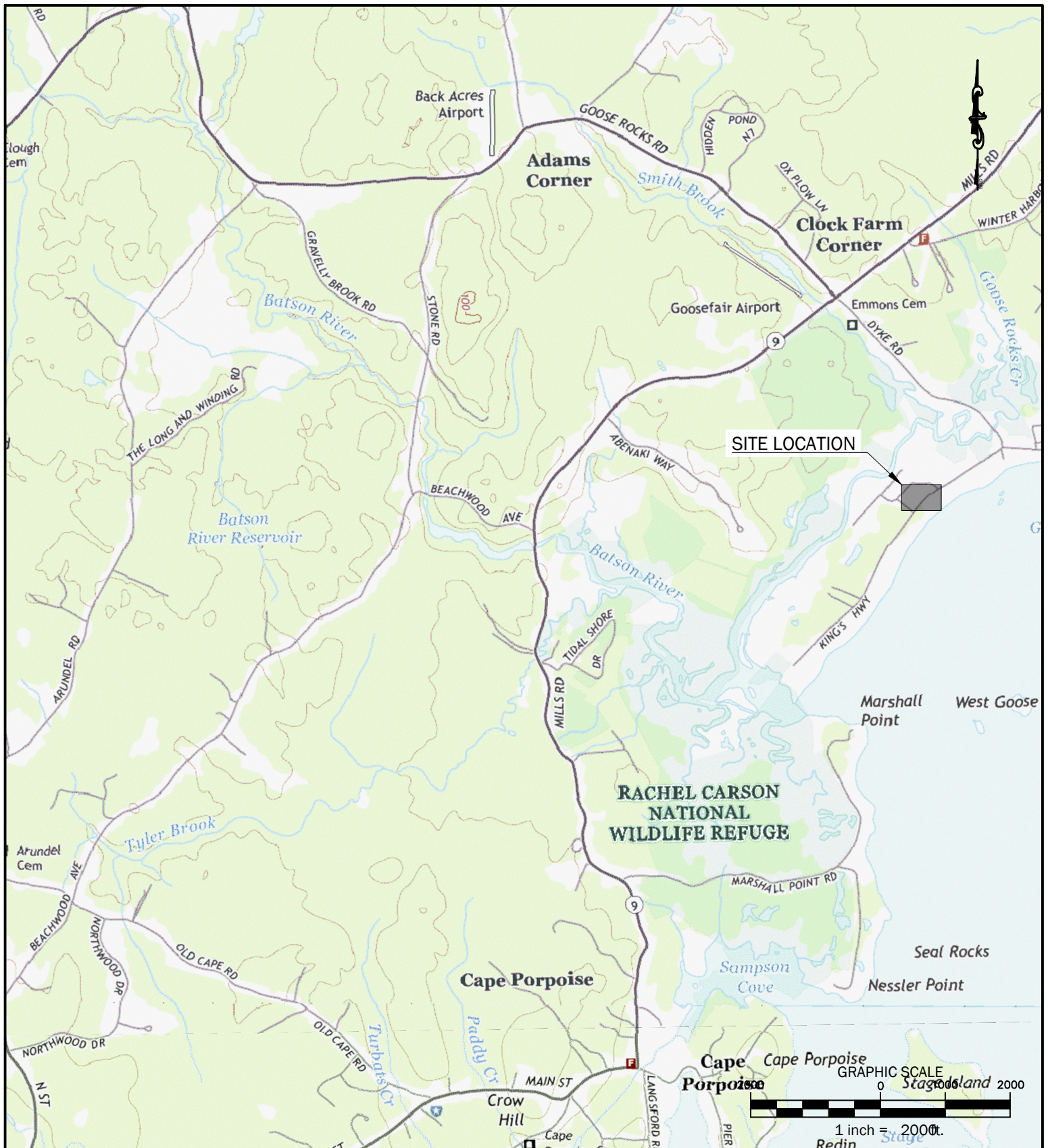
Personally appeared on the above date the above-named **Carole W. Troy, Trustee** of the **Carole W. Troy Revocable Living Trust** of in her stated capacity and acknowledged the foregoing instrument to be her free act and deed.

Before me,


Notary Public/Attorney at Law
Print name: _____
Exp: _____

Kerry E. Kimball
State of Maine
Attorney at Law
Bar #8577

Attachment 2:
Location Plan



WALSH
ENGINEERING ASSOCIATES, INC.

One Karen Dr., Suite 2A | Westbrook, Maine 04092
ph: 207.553.9898 | www.walsh-eng.com

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LOCATION PLAN

99 Fortunes Rock Road
Biddeford, ME 04005

Sheet Title:

**LOCATION
PLAN**

Job No.: 860

Date: JAN. 26, 2024

Scale: AS SHOWN

Drawn: KEW

Checked: NGC

Attachment 3:
Site Plan Application Checklist

CITY OF BIDDEFORD - SITE PLAN APPLICATION DRAWING CHECKLIST

LAST REVISED: 05/17/23

CHECKLIST DIRECTIONS:

1. The following checklist must be completely filled out by the applicant for any Site Plan submittal to the Planning Department.
2. Applicant to confirm all of the items listed are included within the submittal. Any missing items must have adequate reasoning to justify their absence.
3. City to review applicant's submittal and checklist responses. Projects missing submittal information with non-acceptable reasoning will be rejected.
4. Items in **BLACK** are required for 'Preliminary Site Plan' approval & 'Final Site Plan' approval.
5. Items in **BLUE** are only required for 'Final Site Plan' approval.

SUBMITTAL INFORMATION - TO BE FILLED OUT BY APPLICANT	
Project Name:	99 Fortunes Rocks Road
Planning Board # (if available):	
Applicant Name/Info:	Walsh Engineering Associates, One Karen Drive Suite 2A Westbrook, ME (207) 553-9898
Submittal #/Type (Prelim/Final):	Prelim
Submittal Date:	

SUBMITTAL REQUIREMENT		APPLICANT RESPONSE		CITY REVIEW RESPONSE	
ITEM NUMBER	DESCRIPTION	INFORMATION PROVIDED (YES/NO)	REASON NOT PROVIDED/COMMENT	ACCEPTABLE (YES/NO-REVISE & RESUBMIT)	COMMENT
1	GENERAL PLAN REQUIREMENTS				
A	Drawing specific legends (linetypes, hatches, etc.)	Yes			
B	Individual drawing layer control should be utilized: freeze/thawing, changing lineweights, and screening (i.e. screen existing layers on a proposed plan, freeze topography and underground utilities on a proposed site plan)	Yes			
C	North arrows, standard engineering scale viewports, dated revision blocks	Yes			
D	All drawings and surveys must be in the following coordinate systems: NAD83 Maine State Plane West (Horizontal) and NAVD88 (Vertical)	Yes			
E	Drawings need to be designed, signed & sealed by a Maine licensed professional engineer (PE); all boundary survey data needs to be performed by a licensed professional land surveyor (PLS)	Yes			
2	COVER SHEET				
A	Project Name & Property Address	Yes			
B	Project Team Contact Information (Owner, Engineer, Contractor, etc.)	Yes			
C	Site Location Map	Yes			
D	Sheet Set List of Drawings	Yes			
E	Tax Map and Lot ID	Yes			
F	Zoning & Shoreland Zone Information	Yes			
G	Existing Use Description	Yes			
H	Proposed Use Description	Yes			
I	Required Waiver/Variances (Yes/No); if yes, plan must clearly list waivers/variances requesting	No	Not part of regulated MS4 area		
J	Name of Drainage Watershed	Yes	On Survey Sheet		
K	Within the MS4 Urbanized Area (Yes/No)	No	Not within MS4 Mapping		
L	Natural resources (streams, wetlands, etc.) located on-site or adjacent to the property (Yes/No)	Yes			
M	Within the 100-year Flood Zone (Yes/No)	Yes			
N	Public Road Proposed (Yes/No)	No	No road is being proposed		
O	Private Road Proposed (Yes/No)	No	No road is being proposed		
P	Public Sewer Connection (Yes/No); if yes, need to include a proposed sewer flow calculation per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	Yes	On Erosion Control Plan		
Q	Public Storm Drain Connection (Yes/No)	Yes	On New Building Plan		
R	Limits of Disturbance in acres	Yes	On Erosion Control Plan		
S	Pervious Land Cover square footage, existing and proposed	Yes	On Survey Sheet		
T	Impervious Land Cover square footage (Pavement/Gravel), existing and proposed	Yes	On Survey Sheet		
U	Building Roof square footage, existing and proposed	Yes	On Survey sheet and Site Plan		
V	Assigned Planning Board Number				
W	Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)				
3	EXISTING CONDITIONS PLAN				
A	Horizontal & Vertical Datums annotated (NAD83 & NAVD88)	Yes			
B	Survey Benchmark Locations (with XYZ Coordinates annotated)	Yes	On Survey Sheet		
C	Property & Right-of-Way Lines	Yes			
D	Boundary line information (bearings, distances, etc.)	Yes			
E	Property pin and monumentation locations	Yes			
F	Existing easements with proper ownership identified	Yes	On Survey Sheet		
G	Road Names & Individual Lot Labels (Map, Lot, Owner, Acreage)	Yes			
H	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
I	100-year Flood Zone Limits & Elevation	Yes			
J	USDA-NRCS Soil Boundaries and Labels	Yes			
K	Existing contours with adequate contour labelling; minimum 1' contour interval	Yes			
L	Existing building FFEs annotated	Yes	On Survey Sheet		
M	Spot elevations for existing building corners, door entrances, accessible parking/walkways, road centerlines, and bottom/top of curbs	Yes	On Survey Sheet		
N	Existing buildings & structures	Yes			
O	Existing pavement areas & number of parking spaces	Yes			
P	Existing ADA ramp geometry, detectable warning plates, and ADA parking spaces	No	There is no ADA ramp or parking. This is a single residential home		
Q	Existing site features (sidewalks, retaining walls, curbing, lightpoles, guide rails, dumpsters, fencing)	Yes			
R	Existing signage and striping	No	There is no road or striping needed in the driveway of the single residential home		
S	Existing underground utility locations (storm, sewer, force main, water, gas, elec, tele)	Yes			

T	Existing above-ground utility locations (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Yes			
U	Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	No	There is no information provided in the survey		
V	Existing tree lines, street trees, free-standing trees (12" or larger diameter at breast height), and vegetation	Yes			
W	Location of any borings, drinking wells, and monitoring wells	No	There are no wells		
4	SITE DEMOLITION & EROSION CONTROL (E&SC) PLAN				
A	Limits-of-disturbance outlined and acreage annotated	Yes			
B	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
C	100-year Flood Zone Limits	Yes			
D	Callout existing site features to be demolished/removed/replaced	Yes			
E	Callout existing utilities to be demolished/removed/abandoned-in-place	Yes			
F	Hatch existing buildings and pavement to be removed	Yes			
G	Construction Entrance location(s)	Yes			
H	Perimeter E&SC control location(s) (i.e. silt fence, erosion berm mix)	Yes			
I	Stockpile and staging area(s) identified (with proper perimeter control)	No	There is no stock pile site		
J	Inlet protection location(s)	No	There is no inlet nearby		
K	Note requiring contractor to implement dust control measures throughout construction	No	There is no dust expected from the site development		
L	Note requiring contractor to pave utility trenches within right-of-way within 3 days of excavation or prior to any rain event	Yes	In details		
M	If groundwater expected, show dewatering/silt bag location(s); show temporary pumping routing				
N	If large development is proposed with an extensive underground stormwater conveyance network, show sediment trap/basin location(s) needed for constructability/phasing; provide sizing calculations				
5	SITE PLAN/SUBDIVISION PLAN				
A	Partial Site Plans needed for any viewport scale greater than 1"=20'				
B	Existing property and right-of-way lines	Yes			
C	Proposed subdivision lot lines and labels	No	There is no subdivision		
D	Required Zoning Setbacks shown with dimensions and annotation	Yes			
E	Bulk requirement summary table (zoning/parking calculations)	No	Not applicable		
F	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)	Yes			
G	100-year Flood Zone Limits	Yes			
H	Proposed building outlines, door entrances and loading docks	Yes			
I	Proposed building labels	Yes			
J	Proposed road extents; provide clear annotation if roads will be public or private	No	There is no road being constructed		
K	Proposed parking and accessible parking locations; annotate parking space counts	No	There is no need for accessible parking at a single residential home		
L	Proposed signage, parking striping, and traffic striping	No	There is no markings needed for a single residential home		
M	Detailed ADA ramp geometry, detectable warning surfaces, and ADA parking striping/signage; existing & proposed	No	There is no need for an ADA ramp or parking		
N	Proposed site features (i.e. curbing, walls, fencing, guiderail, fire hydrant, transformers, light pole locations)	Yes			
O	Separate hatching for buildings, sidewalks, pavement, landscaping	Yes			
P	Proposed landscaping; detailed landscaping design should be on separate plans	Yes	On Lanscaping Plan		
Q	Designated snow storage areas	No	There is no snow storage area to be designated		
R	Proposed dumpster locations and trash removal access	No	There is no dumpster on site		
S	Linear dimensions of all drive aisles, sidewalk widths, parking spaces, loading docks	No	This is a private driveway		
T	Radial dimensions for all curbs, landscaped islands, sidewalks	No	There is none		
U	Road centerline stationing shown, labelled every 0+50' with curve data	No	There is no road being proposed.		
V	If Private Road is proposed, final recorded plans must clearly note that proposed private roads will not be submitted in the future for public acceptance	No	There is no road being proposed.		
W	If Private Road is proposed, final recorded plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads	No	There is no road being proposed.		
X	Planning Board signature block for final recording				
6	GRADING PLAN	No	Provided as part of building permit application at a later date		
A	Partial Grading Plans needed for any viewport greater than 1"=20'				
B	Limits-of-disturbance outlined and acreage annotated				
C	Proposed Building Labels with Individual Finished Floor Elevations (FFE)s				
D	Existing contours with adequate contour labelling, screened; minimum 1' contour interval				
E	Proposed contours with adequate contour labelling; minimum 1' contour interval				
F	Detailed grading for all ditches, swales, outfalls, and riprap				
G	All proposed contours tie-into existing contours at limits-of-disturbance outline				
H	Existing spot elevations for all asphalt and curb tie-in locations				
I	Location of any Natural Resources and their respective buffers (wetlands, streams, etc.)				
J	100-year Flood Zone Limits				
K	Proposed spot elevations for all important roadway geometric points and/or on a 50' maximum interval: low/high points, PC/PT, road centerline, edge-of-asphalt				
L	Proposed spot elevations for all curblines (bottom/top-of-curb) and sidewalks				
M	Proposed spot elevations for all parking and drive aisle geometry points				
N	Proposed spot elevations for all building corners and door-entry locations				
O	Proposed retaining wall/loading dock elevations (bottom/top of wall)				
P	Proposed spot elevations for all ADA ramp/landing/parking stall geometry points				
Q	Proposed % slope arrows for all ADA parking spaces and sidewalks				

	R	Proposed longitudinal % slope arrows for drainage ditch centerlines			
	S	Proposed % slope arrows for roads, parking areas, and landscape tie-in areas			
	T	Estimated cut/fill earthwork volumes; if disturbing within Flood Zone, separate set of earthwork volumes required (site vs. within flood zone)			
7		ROAD PROFILES (if public/private road proposed)	N/A	No road involved	
	A	Existing surface; dashed and screened			
	B	Proposed surface; continuous and bold			
	C	Corresponding centerline stationing and curve data annotation			
	D	Road cross-section including proposed surface cross slopes; include multiple sections for various road cross slope conditions proposed (crowned, superelevated)			
	E	Horizontal and vertical scale bars			
	F	Clear annotation if proposed road will be public or private			
	G	If Private Road is proposed, plans must clearly note that proposed private roads will not be submitted in the future for public acceptance			
	H	If Private Road is proposed, plans must clearly note that the City is not responsible for any maintenance, repair, plowing, or trash removal of proposed private roads			
8		UTILITY PLAN			
	A	Existing underground utility locations; screened (storm, sewer, force main, water, gas, electric, telecom)	Yes		
	B	Existing above-ground utility locations; screened (manholes, catch basins, utility poles, hydrants, riprap)	Yes		
	C	Rim, invert in, invert out, pipe size, cardinal direction (N, E, S, W) information for any existing utility infrastructure being tied into (upstream/downstream/outfalls)	No	None proposed	
	D	Proposed underground utility locations; bold (storm, sewer, force main, water, gas, electric, telecom, lighting)	Yes		
	E	Proposed above-ground utility locations; bold (manholes, catch basins, utility poles, hydrants, transformers, riprap)	Yes		
	F	Proposed storm culverts, outfalls, and riprap locations and sizes	No	None proposed	
	G	Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)	Yes		
	H	Storm/sewer pipe labels must include: linear footage, pipe size, material, slope	No	The pipes are located but, there is no specific information	
	I	Flow directional arrows for storm & sewer pipes	No	Not Applicable	
	J	Proposed & existing site features shown that could conflict with proposed utilities (trees, signs, lightpoles, bollards, foundations, guiderails)	Yes		
	K	All storm drains must be sized to convey the 25-year storm			
	L	Sewer force main sizes and invert elevations			
	M	Sewer pump station locations, model, rim, inverts, pipe sizes, cardinal directions (N,E,S,W)			
	N	Grease trap & oil-water separator locations, sizes, elevations			
	O	Water, gas, electric, and telecom sizes labelled			
9		UTILITY PROFILES			
	A	Utility profiles for all gravity storm drains and sewer pipes, including all laterals, catch basins, culverts, and outfalls; profiles preferred to be aligned on the pipe centerline (not superimposed on the road centerline)			
	B	Existing surface; dashed and screened			
	C	Proposed surface; continuous and bold			
	D	Storm/sewer structure labels must include: rim, inverts in, inverts out, pipe sizes, cardinal directions (N, E, S, W)			
	E	Storm/sewer pipe labels must include: linear footage, pipe size, material, slope			
	F	Existing and proposed gravity pipe crossings shown; sizes labelled and depths/clearance annotated			
	G	Existing and proposed electric/water/telecom/gas crossings shown at approximate depths; sizes labelled and depths/clearance annotated			
	H	Known ledge or groundwater elevations			
	I	For all storm drains, 25-year HGL must be shown on profiles with starting tailwater condition identified			
	J	For storm outfalls, include riprap sizing and grading extents			
	K	Horizontal and vertical scale bars			
10		DETAILS			
	A	Road section detail, including pavement & gravel depths	No	There is no road being proposed.	
	B	Sidewalk, paver, crosswalk, and any other pavement section details	No	There is no crosswalks or sidewalks being proposed.	
	C	Pavement sawcut detail	No	Thre is no sawcutting of pavement	
	D	Utility trench/backfill detail	Yes		
	E	All site feature details; curbing, retaining walls, fencing, guiderails, dumpsters, etc.	No	There is no extra site details	
	F	Signage, striping, and ADA details	No	There is no need for ADA or striping	
	G	E&S notes and details; only show applicable/proposed measures	Yes		
	H	Utility structure details (manholes, cleanouts, fittings, handholes, transformer pads, hydrants)	No	None Proposed	
	I	Storm outfall & riprap details	No	There is no outfall or riprap	
	J	Drainage ditch cross section identifying minimum depth, minimum bed width, and maximum side slopes	No	There is no drainage ditch being proposed	
	K	Pump station, grease trap, and oil-water separator details			
	L	Conduit section details			
	M	Miscellaneous details (as needed)			
11		LANDSCAPING, LIGHTING & PHOTOMETRIC PLANS			

	A As required by ordinance; at a minimum: locations, counts, and species/models must be identified				
	B Landscaping & lighting details				
12	DOCUMENTS/REPORTS/CALCULATIONS				
A	On initial preliminary submittal applications, applicant must submit a development review and inspection fee. Applicant to coordinate fee amount with City Planner prior to submittal. This fee will be drawn against to cover the following type of services throughout the project life cycle (and may require replenishing): i. 3rd Party City Peer-Review ii. Site Inspections during the permitting process iii. Erosion & Sediment Control Inspections during construction iv. Right-of-Way Inspections during construction				
B	Predevelopment & Post-development Drainage Area Maps, including: i. Subdrainage areas delineated and labeled ii. Points of Interest/Analysis shown and labeled iii. Hatching for different land cover areas (impervious, pervious, gravel) iv. Time of concentration (Tc) paths & durations v. Four City standardized stormwater summary tables	No	There is no need for a drainage analysis		
C	An approved 'Sewer Ability-to-Serve Letter' from the Engineering Department: i. Applicant to submit proposed sewer flow calculations per Maine's Subsurface Wastewater Disposal Rules, Chapter 241, Section 4 (Tables 4A & 4C)	No	Not applicable		
D	A Performance Guarantee Cost Estimate utilizing Planning's template				
E	For any Site Location of Development (SLODA) project, the applicant's submittal must mimic a formal submittal to DEP. Submit must abide to DEP's SLODA application and include DEP's SLODA Submittal Checklist (Form D)	No	This is not a SLODA.		
F	25-year hydraulic calculations for all storm conveyance infrastructure (pipes, culverts, drainage ditches) via the rational method; starting tailwater conditions/documentation must be clearly identified				
G	If any SWM water quality BMP or detention facility is proposed, hydrologic model exports/hydrographs must be submitted for the for the 2, 10, 25, & 100-year storm frequencies				
H	Sizing calculations for any SWM water quality BMP or detention facility				
I	A stormwater maintenance manual for any proposed SWM water quality BMP or detention facility, including: i. Annual maintenance requirements ii. Annual inspection requirements by a licensed PE; noting that all inspection reports/logs need to be submitted to the Engineering Department by March 1st each following year, identifying what on-going maintenance has occurred and what remedial repairs are needed iii. Signed Property Owner Agreement: including the current property owner's contact information and signature; it must be noted that all stormwater BMP maintenance requirements are linked to the property for perpetuity and transfer to any new ownership				
J	Salt Management Plan				
K	Sewer pump station sizing calculations				
L	Sewer pump station maintenance plan				
M	Grease trap sizing calculations				
N	Homeowner Association (HOA) agreement for any private road serving two (2) lots or more				
O	Summary list & copy of any required DOT/DEP/USACE permits & approvals				

Attachment 4:

Assessment of Compliance with Zoning Standards

Standards Review for 99 Fortunes Rocks

City of Biddeford, ME Part III Land Use Development Regulations

Article XIV Shoreland Zoning Ordinance

Section 12 C: Non-Conformance

Section 15 H1: Roads and Driveways

Section 15 K1: Septic Waste Disposal

Section 12 C: Non-Conformance

1.

Expansions. All new principal and accessory structures, excluding functionally water-dependent uses, must meet the water body, tributary stream, or wetland setback requirements contained in Section 15B1. A nonconforming structure may be added to or expanded after obtaining a permit from the same permitting authority as that for a new structure if such addition or expansion does not increase the nonconformity of the structure and is in accordance with Subparagraphs a and b below.

a.

Expansion of any portion of a structure within 25 feet of the normal high-water line of a water body, tributary stream, or upland edge of a wetland is prohibited, even if the expansion will not increase nonconformity with the water body, tributary stream or wetland setback requirement. Expansion of an accessory structure that is located closer to the normal high-water line of a water body, tributary stream, or upland edge of a wetland than the principal structure is prohibited, even if the expansion will not increase nonconformity with the water body, tributary stream, or wetland setback requirement.

Standard Met: No portions of the replacement structure will be within 25' of the normal high-water mark.

b.

Notwithstanding Subparagraph a, above, if a legally existing nonconforming principal structure is entirely located less than 25 feet from the normal high-water line of a water body, tributary stream, or upland edge of a wetland, that structure may be expanded as follows, as long as all other applicable municipal land use standards are met and the expansion is not prohibited by Section 12C1.

Standard Not applicable: Legally existing structure is located entirely outside of 25' from the high-water mark.

i.

The maximum total footprint for the principal structure may not be expanded to a size greater than 800 square feet or 30% larger than the footprint that existed on January 1, 1989, whichever is greater. The maximum height of the principal structure may not be made greater than 15 feet or the height of the existing structure, whichever is greater.

Standard Not applicable: Legally existing structure is located entirely outside of 25' from the high-water mark.

C.

All other legally existing nonconforming principal and accessory structures that do not meet the water body, tributary stream, or wetland setback requirements may be expanded or altered as follows, as long as other applicable municipal land use standards are met and the expansion is not prohibited by Section 12C1, or Section 12C1a, above.

Standard Applicable: Replacement non-conforming structure will be replaced and expanded per the restrictions specified in Section 12C1.

i.

For structures located less than 100 feet from the normal high-water line of a water body, tributary stream, or upland edge of a wetland, the maximum combined total footprint for all structures may not be expanded to a size greater than 1,000 square feet or 30% larger than the footprint that existed on January 1, 1989, whichever is greater. For structures located less than 75 feet but greater than 25 feet from the normal high-water line of a water body, tributary stream, or the upland edge of a wetland the maximum height of any structure may not be made greater than 20 feet or the height of the existing structure, whichever is greater. For structures located less than 100 feet but greater than 75 feet from the normal high-water line of a water body, tributary stream, or the upland edge of a wetland the maximum height of any structure may not be made greater than 25 feet or the height of the existing structure, whichever is greater.

[Amended 3-7-2017 by Ord. No. 2017-17]

Standard Met: Existing building footprint including decks and steps is 3,622 square feet. The proposed expanded footprint is 4,014 square feet which is less than the allowable 1,000 square feet increase (4,622) or 4,708 (30% allowable increase). The documented current building height (40.5 NAVD88) will be maintained. Proposed replacement building not to exceed current height (40.5 NAVD88) as identified on Sheet C2.0

ii.

In addition to the limitations in Subparagraph i, for structures that are legally nonconforming due to their location within the Resource Protection District, the maximum combined total footprint for all structures may not be expanded to a size greater than 1,500 square feet or 30% larger than the footprint that existed at the time the Resource Protection District was established on the lot, whichever is greater. The maximum height of any structure may not be made greater than 25 feet or the height of the existing structure, whichever is greater, except that any portion of those structures located less than 100 feet from the normal high-water line of a water body, tributary stream, or upland edge of a wetland must meet the footprint and height limits in Section 12C1bi, and Section 12C1ci, above.

Standard Not Applicable: Current structure not located within Resource Protection District.

d.

An approved plan for expansion of a nonconforming structure must be recorded by the applicant with the Registry of Deeds within 90 days of approval. The recorded plan must show the existing and proposed footprint of the nonconforming structure, the existing and proposed structure height, the footprint of any other structures on the parcel, the Shoreland Zone boundary and evidence of approval by the municipal review authority.

Standard Met: Plan sheet 2.0 has been prepared for signature by the Planning Board and will be recorded at the York County Registry of Deeds upon approval.

2.

Foundations. Whenever a new, enlarged, or replacement foundation is constructed under a nonconforming structure, the structure and new foundation must be placed such that the setback requirement is met to the greatest practical extent as determined by the Planning Board, basing its decision on the criteria specified in Section 12C3 (Relocation) below.

Standard Applicable:

3.

Relocation: A nonconforming structure may be relocated within the boundaries of the parcel on which the structure is located, provided that the site of relocation conforms to all setback requirements to the greatest practical extent as determined by the Planning Board, and provided that the applicant demonstrates that the present subsurface sewage disposal system meets the requirements of state law and the State of Maine Subsurface Wastewater

Disposal Rules (Rules), or that a new system can be installed in compliance with the law and said Rules. In no case shall a structure be relocated in a manner that causes the structure to be more nonconforming.

In determining whether the building relocation meets the setback to the greatest practical extent, the Planning Board shall consider the size of the lot, the slope of the land, the potential for soil erosion, the location of other structures on the property and on adjacent properties, the location of the septic system and other on-site soils suitable for septic systems, and the type and amount of vegetation to be removed to accomplish the relocation. When it is necessary to remove vegetation within the water or wetland setback area in order to relocate a structure, the Planning Board shall require replanting of native vegetation to compensate for the destroyed vegetation in accordance with Section 15S. In addition, the area from which the relocated structure was removed must be replanted with vegetation. Replanting shall be required as follows:

Standard Met: Replacement Building has been placed to meet local setbacks to the greatest extent practicable. Building corners have been brought forward to meet the front property line setback. Side and rear property setback lines are met. Due to the presence of ledge, a replacement septic system had to be placed to avoid unsuitable soils. The replacement septic system proposed will require variances that are within the scope of the local plumbing inspector. The system has been designed to meet all design flows and will utilize pre-treatment in order to further reduce the footprint and impact of the system.

a.

Trees removed in order to relocate a structure must be replanted with at least one native tree, three feet in height, for every tree removed. If more than five trees are planted, no one species of tree shall make up more than 50% of the number of trees planted. Replaced trees must be planted no further from the water or wetland than the trees that were removed. Other woody and herbaceous vegetation and ground cover that are removed or destroyed in order to relocate a structure must be reestablished. An area at least the same size as the area where vegetation and/or ground cover was disturbed, damaged, or removed must be reestablished within the setback area. The vegetation and/or ground cover must consist of similar native vegetation and/or ground cover that was disturbed, destroyed or removed.

Standard Met: Site is fully developed. Tree located within the current driveway center will be replaced and further supplemented as shown on Landscape Plan L1.0

b.

Where feasible, when a structure is relocated on a parcel, the original location of the structure shall be replanted with vegetation which may consist of grasses, shrubs, trees, or a combination thereof.

Standard Met: Site is fully developed. Tree located within the current driveway center will be replaced and further supplemented as shown on Landscape Plan L1.0

4.

Reconstruction or replacement. Any nonconforming structure which is located less than the required setback from a water body, tributary stream, or upland edge of a wetland which is removed, or damaged or destroyed regardless of the cause, by more than 50% of the market value of the structure before such damage, destruction or removal, may be reconstructed or replaced provided that a permit is obtained within 18 months of the date of said damage, destruction, or removal, and provided that such reconstruction or replacement is in compliance with the water body, tributary stream or wetland setback requirement to the greatest practical extent as determined by the Planning Board in accordance with the purposes of this ordinance. If the reconstructed or replacement structure is less than the required setback it shall not be any larger than the original structure, except as allowed pursuant to Section 12C1 above, as determined by the nonconforming footprint of the reconstructed or replaced structure at its new location. If the total footprint of the original structure can be relocated or reconstructed beyond the required setback area, no portion of the relocated or reconstructed structure shall be replaced or constructed at less than the setback requirement for a new structure. When it is necessary to remove vegetation in order to replace or reconstruct a structure, vegetation shall be replanted in accordance with Section 12C3 above.

Any nonconforming structure which is located less than the required setback from a water body, tributary stream, or wetland and which is removed by 50% or less of the market value, or damaged or destroyed by 50% or less of the market value of the structure, excluding normal maintenance and repair, may be reconstructed in place if a permit is obtained, from the Code Enforcement Officer within one year of such damage, destruction, or removal.

In determining whether the building reconstruction or replacement meets the setback to the greatest practical extent the Planning Board shall consider in addition to the criteria in Section 12C3 above, the physical condition and type of foundation present, if any.

Standard Met: Permits will be obtained within 18 months of removal of current structure. The site has been carefully reviewed and proposed to meet

replacement to greatest practical extent. Proposed reconstruction will be more conforming that the current structure, is less than the allowable footprint increase that is permitted and will not exceed the current documented building height. In addition, the replacement building will comply with future flood plain elevation requirements.

Section 15 H1: Roads and Driveways

1.

Roads and driveways shall be set back at least 100 feet, horizontal distance, from the normal high-water line of a great pond classified GPA or a river that flows to a great pond classified GPA, and 75 feet, horizontal distance, from the normal high-water line of other water bodies, tributary streams, or the upland edge of a wetland unless no reasonable alternative exists as determined by the Planning Board. If no other reasonable alternative exists, the road and/or driveway setback requirement shall be no less than 50 feet, horizontal distance, upon clear showing by the applicant that appropriate techniques will be used to prevent sedimentation of the water body, tributary stream, or wetland. Such techniques may include, but are not limited to, the installation of settling basins, and/or the effective use of additional ditch relief culverts and turnouts placed so as to avoid sedimentation of the water body, tributary stream, or wetland. On slopes of greater than 20% the road and/or driveway setback shall be increased by 10 feet, horizontal distance, for each five-percent increase in slope above 20%.

Standard Met: Existing Driveway has been relocated to the greatest practical extent and meets the 50' minimum setback as allowable.

Section 15 K1: Septic Waste Disposal

1.

All subsurface sewage disposal systems shall be installed in conformance with the State of Maine Subsurface Wastewater Disposal Rules and the following: a) clearing or removal of woody vegetation necessary to site a new system and any associated fill extensions, shall not extend closer than 75 feet, horizontal distance, from the normal high-water line of a water body or the upland edge of a wetland and b) a holding tank is not allowed for a first-time residential use in the Shoreland Zone.

Standard Met: Replacement Septic System will be in compliance with the State of Maine Subsurface Wastewater Disposal Rules and will be setback more than 75' from the normal high-water line.

Attachment 5:

DEP Permit by Rule Application

**DEPARTMENT OF ENVIRONMENTAL PROTECTION
PERMIT BY RULE NOTIFICATION FORM**

(For use with DEP Regulation, Natural Resources Protection Act - Permit by Rule Standards, Chapter 305)

APPLICANT INFORMATION (Owner)				AGENT INFORMATION (If Applying on Behalf of Owner)			
Name:	Jonathan and Elizabeth Bebee			Name:	Werner Gilliam-Walsh Engineering		
Mailing Address:	7638 Pine Tree Drive			Mailing Address:	1 Karen Drive		
Mailing Address:				Mailing Address:	Suite 2A		
Town/State/Zip:	Vactor, NY 14564			Town/State/Zip:	Westbrook, ME 04092		
Daytime Phone #:	(978) 792-4677	Ext:		Daytime Phone #:	(207) 553-9898	Ext:	
Email Address:	jonbebee1@gmail.com			Email Address:	werner@walsh-eng.com		
PROJECT INFORMATION							
Part of a larger project? (check 1):	☐ Yes ☒ No	After the Fact? (check 1):	☐ Yes ☒ No	Project involves work below mean low water? (check 1):	☐ Yes ☒ No	Name of waterbody:	Atlantic Ocean
Project Town:	Biddeford		Town Email Address:	Danielle.Charron@biddeford		Map and Lot Number:	Map 62 Lot 2
Brief Project Description:	Replacement of existing single family home with accessory apartment						
Project Location & Brief Directions to Site:	Take exit 2A from I-195E onto US RT 1. Turn left onto Water Street. Continue straight onto Clifford Street. Turn Left onto Pool Street. Follow Elizabeth Rd to Fortunes Rocks Rd.						

PERMIT BY RULE (PBR) SECTIONS (Check at least one): I am filing notice of my intent to carry out work that meets the requirements for Permit-by-Rule (PBR) under DEP Rules, [Chapter 305](#). I and my agent(s), if any, have read and will comply with all of the standards in the Sections checked below.

- | | | |
|--|--|--|
| ☒ Sec. (2) Act. Adj. to Prot. Natural Res. | ☐ Sec. (9) Utility Crossing | ☐ Sec. (16) Coastal Sand Dune Projects |
| ☐ Sec. (3) Intake Pipes | ☐ Sec. (10) Stream Crossing | ☐ Sec. (16-A) Beach Nourishment |
| ☐ Sec. (4) Replacement of Structures | ☐ Sec. (11) State Transportation Facilities | ☐ Sec. (17) Transfer/Permit Extension |
| ☐ Sec. (6) Movement of Rocks or Veg. | ☐ Sec. (12) Restoration of Natural Areas | ☐ Sec. (18) Maintenance Dredging |
| ☐ Sec. (7) Outfall Pipes | ☐ Sec. (13) F&W Creat./Water Qual. Improv. | ☐ Sec. (19) Act. Near SVP Habitat |
| ☐ Sec. (8) Shoreline Stabilization | ☐ Sec. (15) Public Boat Ramps | ☒ Sec. (20) Act. Near Waterfowl/Bird Habitat |

NOTE: Municipal permits also may be required. Contact your local code enforcement office for information. Federal permits may be required for stream crossings and for projects involving wetland fill. Contact the Army Corps of Engineers at the Maine Project Office for information.

NOTIFICATION FORMS CANNOT BE ACCEPTED WITHOUT THE NECESSARY ATTACHMENTS AND FEE

- ☒ **Attach** all required submissions for the PBR Section(s) checked above. The required submissions for each PBR Section are outlined in Chapter 305 and may differ depending on the Section you are submitting under.
- ☒ **Attach** a location map that clearly identifies the site (U.S.G.S. topo map, Maine Atlas & Gazetteer, or similar).
- ☐ **Attach Proof of Legal Name** if applicant is a corporation, LLC, or other legal entity. Provide a copy of Secretary of State's registration information (available at <http://icrs.informe.org/nei-sos-icrs/ICRS?MainPage=x>). Individuals and municipalities are not required to provide any proof of identity.

FEE: Pay by credit card at the [Payment Portal](#). The Permit-by-Rule fee may be found here <https://www.maine.gov/dep/feeschedule.pdf> and is currently \$307.

- ☒ **Attach** payment confirmation from the Payment Portal when filing this notification form.

Signature & Certification:

- I authorize staff of the Departments of Environmental Protection, Inland Fisheries & Wildlife, and Marine Resources to access the project site for the purpose of determining compliance with the rules.
- I understand that this PBR becomes effective 14 calendar days after receipt by the Department of this completed form, the required submissions, and fee, *unless the Department approves or denies the PBR prior to that date.*

By signing this Notification Form, I represent that the project meets all applicability requirements and standards in Chapter 305 rule and that the applicant has sufficient title, right, or interest in the property where the activity takes place.

Signature of Agent or Applicant (may be typed):	Werner Gilliam	Date:	03/28/2024
--	----------------	--------------	------------

Keep a copy as a record of permit. Email this completed form with attachments to DEP at: DEP.PBRNotification@maine.gov. DEP will send a copy to the Town Office as evidence of DEP's receipt of notification. No further authorization will be issued by DEP after receipt of notice. A PBR is valid for two years, except Section 4, "Replacement of Structures," are valid for three years. **Work carried out in violation of the Natural Resources Protection Act or any provision in Chapter 305 is subject to enforcement.**

Attachment 6:

Photos

99 Fortunes Rocks Rd
Biddeford ME 04005

Photo No. 1

Date: 2023-06-29

Site Location:
99 Fortunes Rocks Rd

Description:
View of the existing home.



Photo No. 2

Date: 2023-06-29

Site Location:
99 Fortunes Rocks Rd

Description:
View of the existing home.



99 Fortunes Rocks Rd
Biddeford ME 04005

Photo No. 3

Date: 2023-06-29

Site Location:
99 Fortunes Rocks Rd

Description:
View of the existing home



Photo No. 4

Date: 2023-06-29

Site Location:
99 Fortunes Rocks Rd

Description:
View of the existing home.



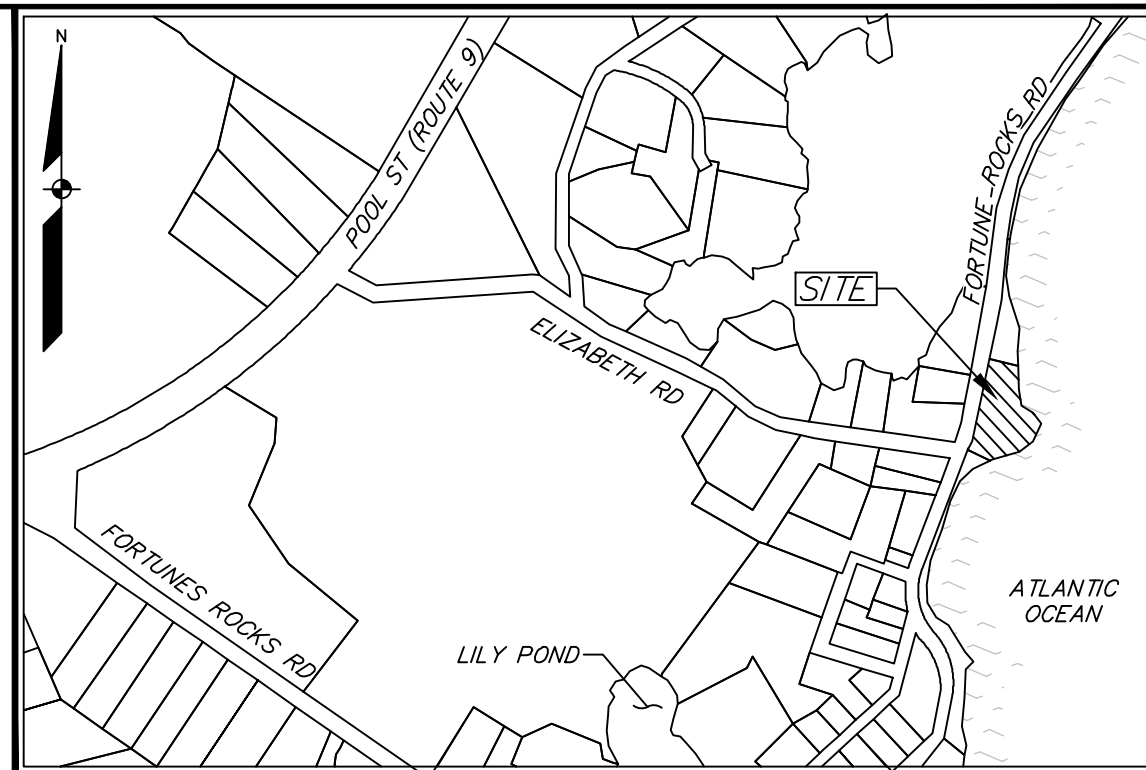
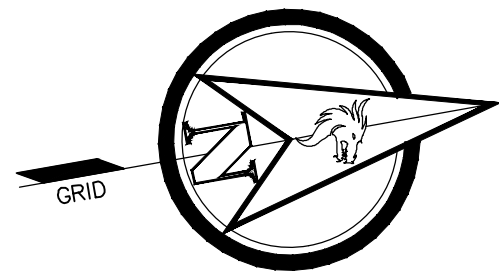
Applicant / Owner:
Jonathan and Elizabeth Beebe
99 Fortunes Rocks Road
Biddeford, Maine 04005
Site Plan Review

Jonathan and Elizabeth Beebe
99 Fortunes Rocks Road
Biddeford, Maine 04005
Site Plan Review

RECORDING DATA

STATE OF MAINE
YORK COUNTY REGISTRY OF DEEDS
RECEIVED
AT _____ h _____ m _____ M. RECORDED IN
FILE NUMBER _____
ATTEST _____ REGISTRAR

FOR REGISTRY USE ONLY



LOCATION MAP

N.T.S.

GENERAL NOTES:

- THE RECORD OWNERS OF THE PARCEL ARE JONATHAN & ELIZABETH BEEBE BY DEED DATED OCTOBER 14, 2021 AND RECORDED AT THE YORK COUNTY REGISTRY OF DEEDS IN BOOK 18837, PAGE 185, AND IS SHOWN AS LOT 6 ON THE CITY OF BIDDEFORD TAX MAP 65.
- THE PROPERTY IS LOCATED IN THE COASTAL RESIDENTIAL (CR) ZONE, LIMITED RESIDENTIAL (LR) OVERLAY & PARTIALLY WITHIN THE EROSION HAZARD AREA & BACK DUNE (MAINE GEOLOGICAL SURVEY).

LAND USE REGULATIONS ARE AS FOLLOWS:

COASTAL RESIDENTIAL (CR):

MINIMUM LOT SIZE:	VARIABLES PER SOIL PROFILE (ARTICLE V, TABLE C)
MINIMUM STREET FRONTAGE:	150 FT
MINIMUM FRONT YARD:	MAJOR R.O.W. 40 FT, MINOR R.O.W. 25 FT
MINIMUM SIDE & REAR YARD:	25 FT**
MAXIMUM BUILDING HEIGHT:	35 FT/THREE STORIES

LIMITED RESIDENTIAL (LR) OVERLAY

THERE IS LESS THAN 100 FT BETWEEN THE H.A.T. LINE AND THE ROAD, THE ENTIRE PARCEL IS ENCOMPASSED IN THE LIMITED RESIDENTIAL (LR) OVERLAY. SEE BIDDEFORD SHORELAND ZONING ORDINANCE, SECTION 12 REGARDING EXPANSION OF NON-CONFORMING PROPERTIES.

MINIMUM LOT SIZE: 30,000 SF (SHORELAND ZONE, TIDAL)

MINIMUM SHORELAND FRONTAGE: 150 FT

MAXIMUM BUILDING HEIGHT: 20 FT OR EXISTING (SECTION 12.C.1.c.i)***

MAXIMUM NON-VEGETATED COVERAGE: 20% (20% OF 60,000 SF = 12,000 SF)

* SEE ORDINANCE FOR MORE PARTICULAR INFORMATION. INFORMATION MUST BE VERIFIED WITH THE APPLICABLE REGULATORY PRIOR TO CONSTRUCTION AND SETBACKS DEPICTED ARE FOR INFORMATIONAL PURPOSES ONLY.

** VARIANCES MAY BE GRANTED UNDER CERTAIN CONDITIONS THAT RESULT IN "A SITUATION WHERE THE SETBACK SHALL BE NO LESS THAN: FRONT YARD 40 FT, SIDE YARD 10 FT." ARTICLE V ESTABLISHMENT OF ZONES, TABLE C NOTES.

*** MAXIMUM HEIGHT MAY MOVE TO ANOTHER SECTION OF 12.C.1 WITH A WETLAND DELINEATION.

- TOTAL AREA OF PARCEL IS APPROXIMATELY 1.4 ACRES.
- TOPOGRAPHIC AND BOUNDARY INFORMATION SHOWN HEREON IS BASED UPON AN ON-THE-GROUND SURVEY COMPLETED BY NORTHERN SURVEY ENGINEERING, LLC IN MARCH, 2022.
- FIELDWORK COMPLETED DURING WINTER CONDITIONS. SOME SITE FEATURES MAY BE OBSCURED. FIELD VERIFICATION OF SITE CONDITIONS MAY BE REQUIRED AFTER SNOW AND ICE HAS MELTED.
- BEARINGS SHOWN HEREON ARE IN REFERENCE TO GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE 1802-NAD83. ELEVATIONS DEPICTED HEREON ARE IN REFERENCE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED GPS OBSERVATIONS.
- UTILITY INFORMATION DEPICTED HEREON IS COMPILED USING PHYSICAL SURFACE EVIDENCE LOCATED IN THE FIELD IN CONJUNCTION WITH ANY RECORD INFORMATION AVAILABLE AT THE TIME OF THIS SURVEY (SUE LEVEL C), AND MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. CONTRACTORS AND/OR DESIGNERS NEED TO CONTACT DIG-SAFE SYSTEMS, INC. (1-888-DIG-SAFE) AND FIELD VERIFY EXISTING UTILITIES PRIOR TO CONSTRUCTION AND/OR EXCAVATION.
- HIGHEST ANNUAL TIDE (H.A.T.) IS SHOWN PER THE NATIONAL OCEAN SERVICES (N.O.S.) ELEVATION FOR BIDDEFORD OF 7.4 FEET (NAVD88) AS STATED IN THE CITY OF BIDDEFORD ZONING ORDINANCE "UPLAND EDGE OF WETLAND" SEE ARTICLE XIV, SECTION 17. NEITHER A WETLAND DELINEATION NOR A TIDE STUDY WAS PERFORMED AS PART OF THIS SURVEY.
- THE NEAREST STATION PUBLISHED IN 2018 BY THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, IN THE VICINITY OF THE SURVEYED PROPERTY IS CAMP ELLIS, SAGO RIVER, STATION ID: 8418606 WITH AN ELEVATION 6.6 FEET NAVD88.
- THE LOCUS PROPERTY AS DEPICTED HEREON DOES FALL PARTIALLY WITHIN A SPECIAL FLOOD HAZARD AREA AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR THE CITY OF BIDDEFORD, MAINE, YORK COUNTY, COMMUNITY-PANEL NUMBER 230145 0011 B, HAVING AN EFFECTIVE DATE OF MAY 15, 1984. THE LOCUS FALLS WITHIN AREAS IDENTIFIED AS:
 - ZONE C: AREA OF MINIMAL FLOODING
 - ZONE A0 (DEPTH 1'): AREAS OF 100-YEAR SHALLOW FLOODING WHERE DEPTHS ARE BETWEEN ONE AND THREE FEET; AVERAGE DEPTHS OF INUNDATION ARE SHOWN, BUT NOT FLOOD HAZARD FACTORS ARE DETERMINED.
 - ZONE A2: AREAS OF 100-YEAR FLOOD (ELEV. 10 NGVD29, ELEV. 9.3 NAVD88),
 - ZONE V2: AREAS 100-YEAR COSTAL FLOOD WITH VELOCITY (WAVE ACTION); BASE FLOOD ELEVATIONS AND FLOOD HAZARD FACTORS DETERMINED. (ELEV. 11, 12 & 13 (NGVD29), ELEV 10.3, 11.3 & 12.3 (NAVD88).

IMPERVIOUS SURFACES

BUILDING	2,431 SF
DECK & STEPS	1,191 SF
PAVEMENT	2,558 SF
GRAVEL	234 SF
CONCRETE	139 SF
BRICK	114 SF
NON RETAINING WALLS	359 SF
TOTAL	7,026 SF

SITE AREA 60,800 SF

LEDGE 158 SF

SITE AREA - LEDGE = 60,642 SF

SURVEYORS CERTIFICATION:

THIS SURVEY WAS PERFORMED UNDER MY DIRECT SUPERVISION AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT WAS DONE IN ACCORDANCE WITH CHAPTER 90, PART 1 (PROFESSIONAL STANDARDS OF PRACTICE) AND PART 2 (TECHNICAL STANDARDS OF PRACTICE) OF THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS.

Tara Mullen
TARA M. MULLEN, MAINE PLS 2575

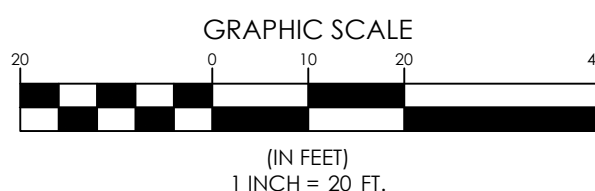
3/30/2022
DATE

LEGEND

---	PROPERTY LINE
- - - -	ABUTTER LINE
- - - -	RIGHT-OF-WAY LINE
- - - -	SETBACK
- - - -	FLOODPLAIN
- - - -	H.A.T. LINE
	BUILDING
	DECK/STEPS
	DORMER
	OVERHANG
	EDGE PAVEMENT
	EDGE CONCRETE
	EDGE GRAVEL
---120---118---	CONTOURS
x120.00	SPOT GRADE
---o---o---	STOCKADE FENCE
	STONE & MORTAR STONEWALL
o-o-o-o-o	STONE WALL
OHU	OVERHEAD UTILITY
W	WATER (PER CITY GIS)
	MAINE GIS SAND DUNE EROSION HAZARD AREA
---	MAINE GIS SAND DUNE BOUNDARIES
---	EDGE OF WATER
	LEDGE

N/F	NOW OR FORMERLY
A.G.	ABOVE GRADE
B.G.	BELOW GRADE
⊙	IRON PIPE/ROD FOUND
⊙	SURVEY CONTROL
⊙	WATER GATE VALVE
⊙	WATER SHUT OFF
⊙	HYDRANT
⊙	UNMARKED MANHOLE
⊙	ELECTRIC METER
⊙	UTILITY POLE
⊙	GUY WIRE
⊙	DECIDUOUS TREE
⊙	CONIFEROUS TREE
⊙	CATCH BASIN

ATLANTIC OCEAN
(TIDAL)



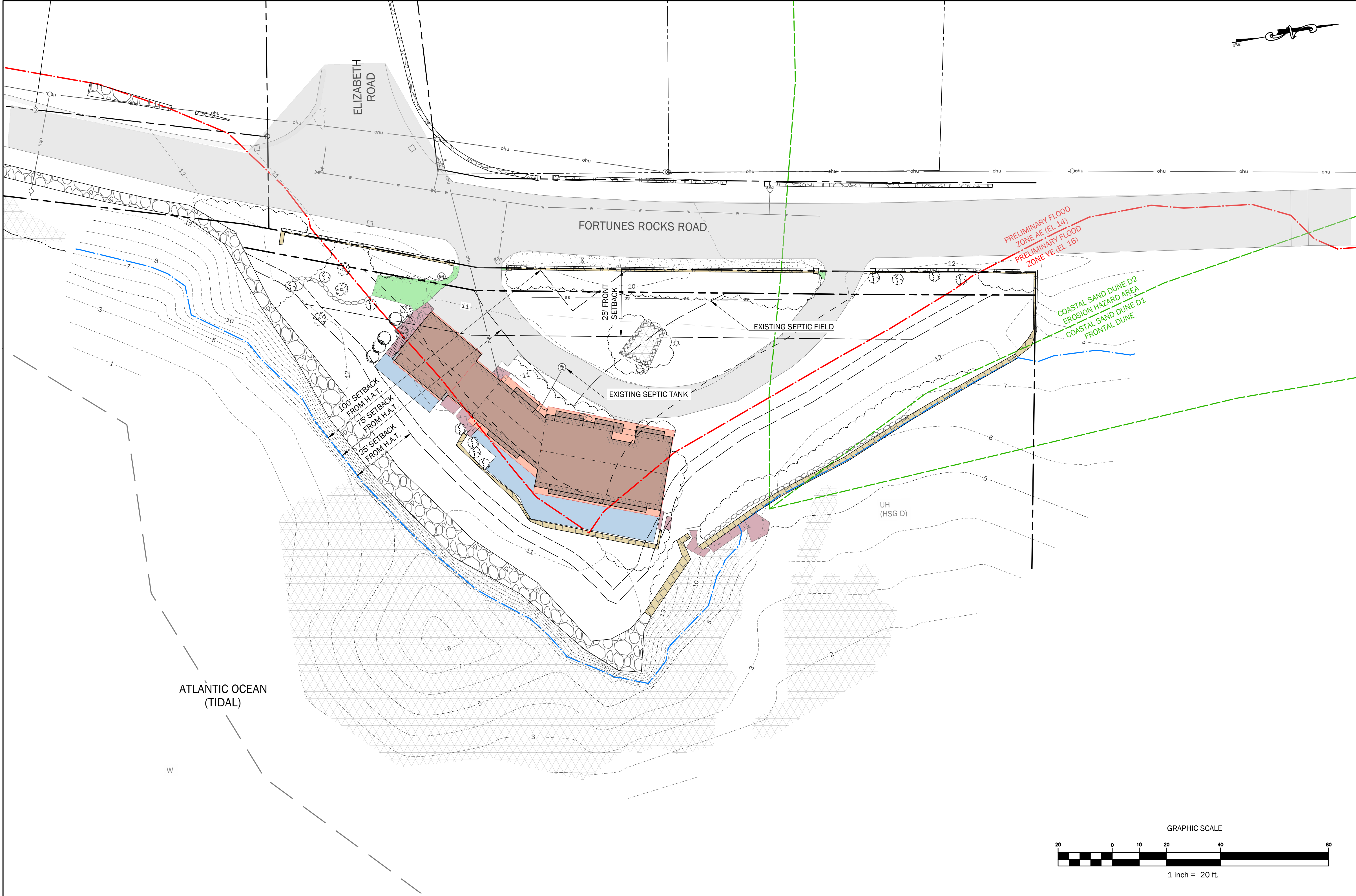
TOPOGRAPHIC SURVEY

OF:
JONATHAN & ELIZABETH BEEBE
99 FORTUNES ROCKS ROAD
BIDDEFORD, MAINE 04005

FOR:
CALEB JOHNSON STUDIO
110 EXCHANGE STREET
PORTLAND, MAINE 04101

DRAWN	CHECKED
TMM	PHB
PROJECT NO.	DATE
21008068	03/30/22
SHEET SIZE	SCALE
24" X 36"	1" = 20'

SHEET 2 OF 2



LEGEND

ROAD

IRF or IPF

IPF 2" DIA 3" AG

N/F "OWNERS NAME" TAX MAP TAX LOT DEED BOOK AND PAGE

PROPERTY LINE

RIGHT-OF-WAY LINE

EASEMENT

PROPERTY SETBACK

IRON ROD OR PIN FOUND

CONCRETE MONUMENT FOUND

GRANITE MONUMENT FOUND

STONE PILE

FENCE POST

EVIDENCE DESCRIPTION

STONEWALL (BOUNDARY)

ABUTTER IDENTIFICATION

SAND DUNE

FLOOD ZONE

HIGHEST ANNUAL TIDE

HIGHEST ANNUAL TIDE SETBACK

BUILDING

RIPRAP

EDGE OF LANDSCAPED AREA

LANDSCAPE/RETAINING WALL

LAWN LINE

EXPOSED LEDGE

OVERHEAD UTILITY

WATERLINE

SANITARY SEWER LINE

BITUMINOUS PAVEMENT

WALSH

ENGINEERING ASSOCIATES, INC.

One Karen Dr., Suite 2A | Westbrook, Maine 04092
ph: 207.553.9898 | www.walsh-eng.com

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STATE OF MAINE

WILLIAM R. WALSH, III

No. 8204

LICENSED PROFESSIONAL ENGINEER

4/11/2024

PROPOSED HOUSE RECONSTRUCTION

99 FORTUNES ROCKS ROAD
BIDDEFORD, MAINE 04005

PREPARED FOR:
JONATHAN AND ELIZABETH BEEBE

99 FORTUNES ROCKS ROAD
BIDDEFORD, ME 04005

Rev.	Date	Description	Drawn	Check
1	12/11/2022	Biddeford Code Meeting	JDC	WDG
2	03/29/2024	New House	KRM	WDG
3	03/29/24	DEP PBR Submission	KRM	WDG
4	04/11/24	City Submission	KRM	WDG

Sheet Title:
EXISTING CONDITIONS

Job No.: 828

Date: JULY 2023

Scale: AS SHOWN

Drawn: JDC

Checked: WRW

Sheet No.:

C1.0

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING "DIG SAFE" AND LOCAL UTILITY COMPANIES AT LEAST THREE (3) BUSINESS DAYS, BUT NOT MORE THAN 30 CALENDAR DAYS, PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION, IN ACCORDANCE WITH MAINE STATE LAW. "DIG SAFE" TELEPHONE NUMBER IS 1-888-344-7233.

2. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL AND ANY MEANS, METHODS, AND TECHNIQUES EMPLOYED TO PERFORM THE WORK SHOWN ON THE PLANS.

3. ALL WORK SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS INCLUDING ALL SAFETY REGULATIONS (OSHA).

4. ALL WORK SHALL BE IN CONFORMANCE ALL UTILITY COMPANIES STANDARDS.

5. THE CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR THE WORK SHOWN ON THESE PLANS PRIOR TO CONSTRUCTION.

6. ALL PAVEMENT/CONCRETE CUTS SHALL BE SAW CUT TO RESULT IN CLEAN EDGES. A TACK COAT SHALL BE APPLIED ALONG THE PAVEMENT CUT EDGES AND THE NEW PAVEMENT BUTTED TO IT, UNLESS OTHERWISE DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE.

7. ALL WORK SHALL COMPLY WITH THE CITY OF BIDDEFORD STREET OPENING PERMIT REQUIREMENTS.

8. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY SITE EXCAVATION OR REGRADING. REFER TO THE WRITTEN EROSION CONTROL PLAN AND DRAWINGS FOR FURTHER EROSION CONTROL GUIDELINES.

9. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS SHOWN ON THE DRAWINGS. IF ANY DISCREPANCIES ARE FOUND, THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE NOTIFIED IMMEDIATELY.

PARCEL INFORMATION:

OWNER OF RECORD: JONATHAN AND ELIZABETH BEEBE

PROPERTY ADDRESS: 99 FORTUNES ROCKS ROAD

PARCEL SHOWN HEREON IS CITY OF BIDDEFORD TAX MAP 65, LOT 2.

TOTAL AREA OF PARCEL: 1.4 ACRES, 60,800 SQ. FT

CURRENT ZONE: COASTAL RESIDENTIAL WITH LIMITED RESIDENTIAL SHORELAND OVERLAY

SHORELAND ZONING INFORMATION:

ZONING STANDARDS FROM CITY OF BIDDEFORD SHORELAND ZONING ORDINANCE ARTICLE XIV. REFERENCES INCLUDE LEGISLATION THROUGH 1/31/2023.

CLASSIFICATION: LIMITED RESIDENTIAL

PERMITTED USES: SINGLE-FAMILY RESIDENTIAL USES

MIN. LOT SIZE: (SECTION 15.A) 30,000 S.F.

MIN. SHORE FRONTAGE: (SECTION 15.A) 150 FEET

PROVIDED: 150 FEET

STRUCTURE SETBACK FROM NORMAL HIGH WATER: (SECTION 15.B.1) 100 FEET

DRIVEWAY SETBACK FROM NORMAL HIGH WATER: (SECTION 15.H.1) 75 FEET*

MAX. BUILDING HEIGHT: (SECTION 15.B.2) 35 FEET

LOWEST FLOOR ELEVATION OR OPENING: (SECTION 15.B.3) 1 FOOT ABOVE 100 YEAR FLOOD

*UNLESS NO REASONABLE ALTERNATIVE EXISTS AS DETERMINED BY THE PLANNING BOARD. IF NO OTHER REASONABLE ALTERNATIVE EXISTS, THE ROAD AND/OR DRIVEWAY SETBACK REQUIREMENT SHALL BE NO LESS THAN 50 FEET, HORIZONTAL DISTANCE

COASTAL RESIDENTIAL ZONING INFORMATION*:

CLASSIFICATION: COASTAL RESIDENTIAL

PERMITTED USES: SINGLE-FAMILY DWELLING

MIN. LOT SIZE: 30,000 S.F.

MAX. BUILDING HEIGHT: 35 FEET

FRONTAGE (W/ WATER OR SEWER): 150 FEET

SETBACKS: FRONT: 25 FEET

PROVIDED: 25 FEET

SIDE: 25 FEET

PROVIDED: 25 FEET

REAR: 25 FEET

PROVIDED: 25 FEET

MAX. BUILDING HEIGHT: 35 FEET (3 STORIES)

*ZONING STANDARDS FROM CITY OF BIDDEFORD ESTABLISHMENT OF ZONES ARTICLE V, TABLE A, TABLE B, REFERENCES INCLUDE LEGISLATION THROUGH 1/31/2023

PLAN REFERENCES:

1. TOPOGRAPHIC AND PROPERTY BOUNDARY INFORMATION TAKEN FROM A COMPILATION OF THE FOLLOWING:

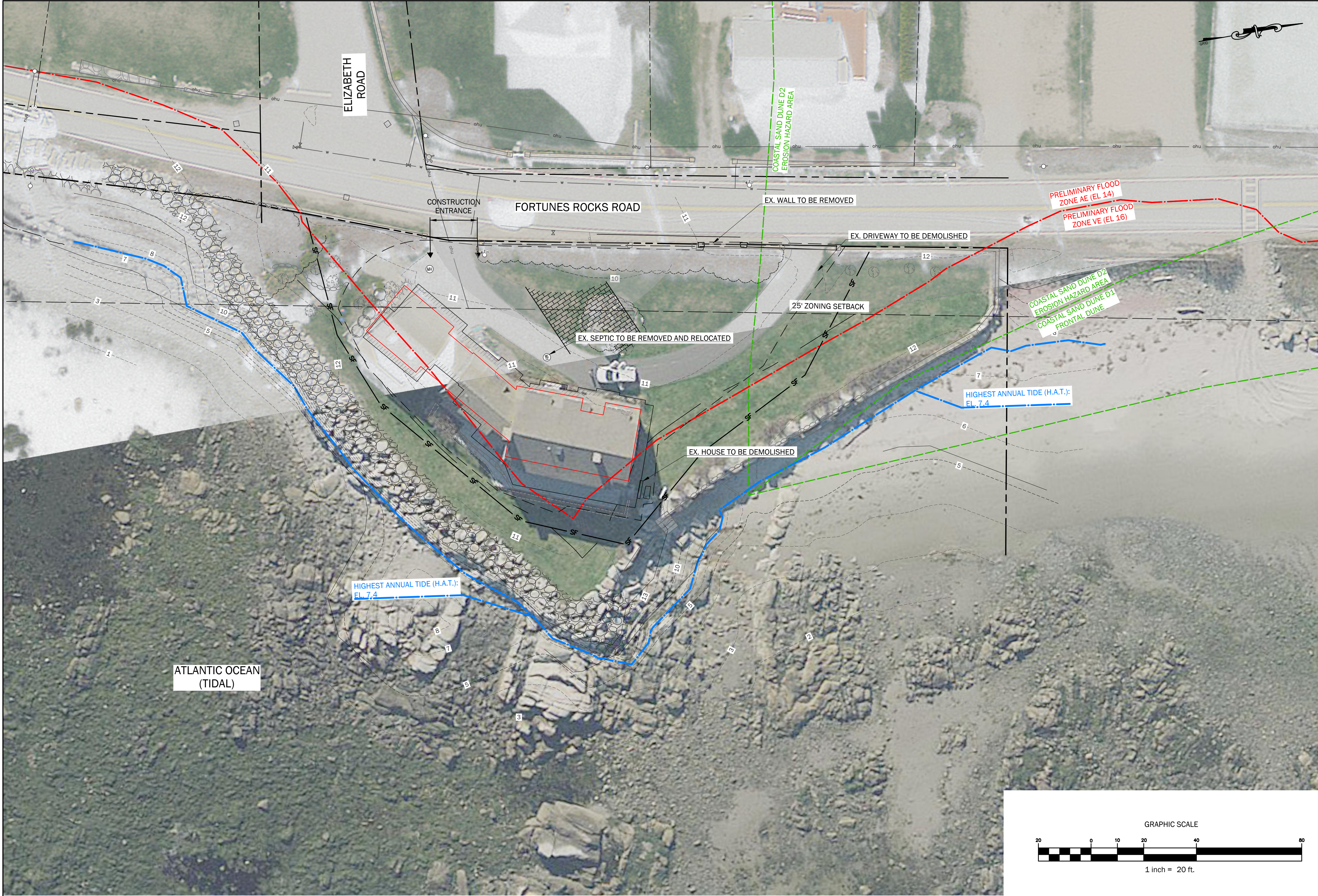
1.1. A PLAN TITLED:
BOUNDARY SURVEY
OF JONATHAN AND ELIZABETH BEEBE
99 FORTUNES ROCKS ROAD
BY COLLIER'S ENGINEERING & DESIGN OF 41 CHURCH ROAD, BRUNSWICK, MAINE 04011
DATED 3/30/2022.

2. ELEVATIONS SHOWN REFERENCE THE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88).

DATE: 04/11/2024 BY: JDC/WRW CHECKED: WRW/WDG

PRELIMINARY - NOT FOR CONSTRUCTION





EXISTING

ROAD

IRF or IPF

PROPOSED

PROPERTY LINE

RIGHT-OF-WAY LINE

ABUTTERS PROPERTY LINE

TOWN LINE

IRON ROD OR PIN FOUND

HIGHEST ANNUAL TIDE

BUILDING

RIPRAP

FIELD DETERMINED RIPRAP

LANDSCAPE/RETAINING WALL

EXPOSED LEDGE

LIGHT JUNCTION

EDGE OF LANDSCAPED AREA

TREE

SAND DUNE

WATERLINE

WATER LINE GATE VALVE

HYDRANT

OVERHEAD UTILITY

STORM DRAIN CATCH BASIN

SANITARY BED

RETAINING WALL

WATER LINE SHUT-OFF VALVE

INDEX CONTOUR

INTERMEDIATE CONTOUR

FLOOD ZONE

29.3' ENVIRONMENTAL SETBACK

25' ENVIRONMENTAL SETBACK

DRIVEWAY

LIMIT OF DISTURBANCE

EROSION CONTROL

Areas	Square Feet
Ex. House	2431
Ex. Deck and Steps	1191
Limit of Disturbance	12904

WALSH
ENGINEERING ASSOCIATES, INC.

One Karen Dr., Suite 2A | Westbrook, Maine 04092
ph: 207.553.9898 | www.walsh-eng.com

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STATE OF MAINE
WILLIAM R. WALSH, III
No. 8204
LICENSED PROFESSIONAL ENGINEER
4/12/2024

PROPOSED HOUSE RECONSTRUCTION

99 FORTUNES ROCKS ROAD
BIDDEFORD, MAINE 04005

PREPARED FOR:
JONATHAN AND ELIZABETH BEEBE
99 FORTUNES ROCKS ROAD
BIDDEFORD, ME 04005

PRELIMINARY - NOT FOR CONSTRUCTION

Rev.	Date	Description	Drawn	Check
1	10/11/2022	Biddeford Code Meeting	JDC	WDG
2	03/25/2024	New House	KRM	WDG
3	03/28/24	DEP PBR Submission	KRM	WDG
4	04/11/24	City Submission	KRM	WDG

Sheet Title:

SITE REMOVAL AND EROSION CONTROL

Job No.: 828

Date: JULY 2023

Scale: AS SHOWN

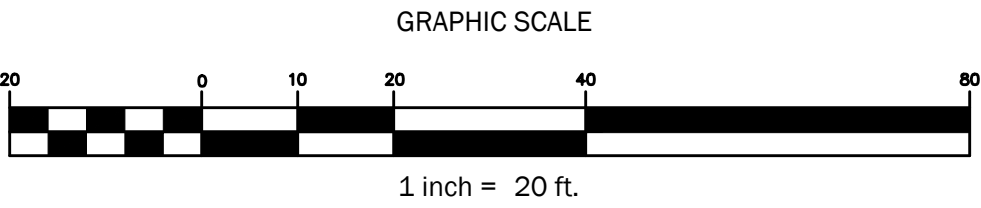
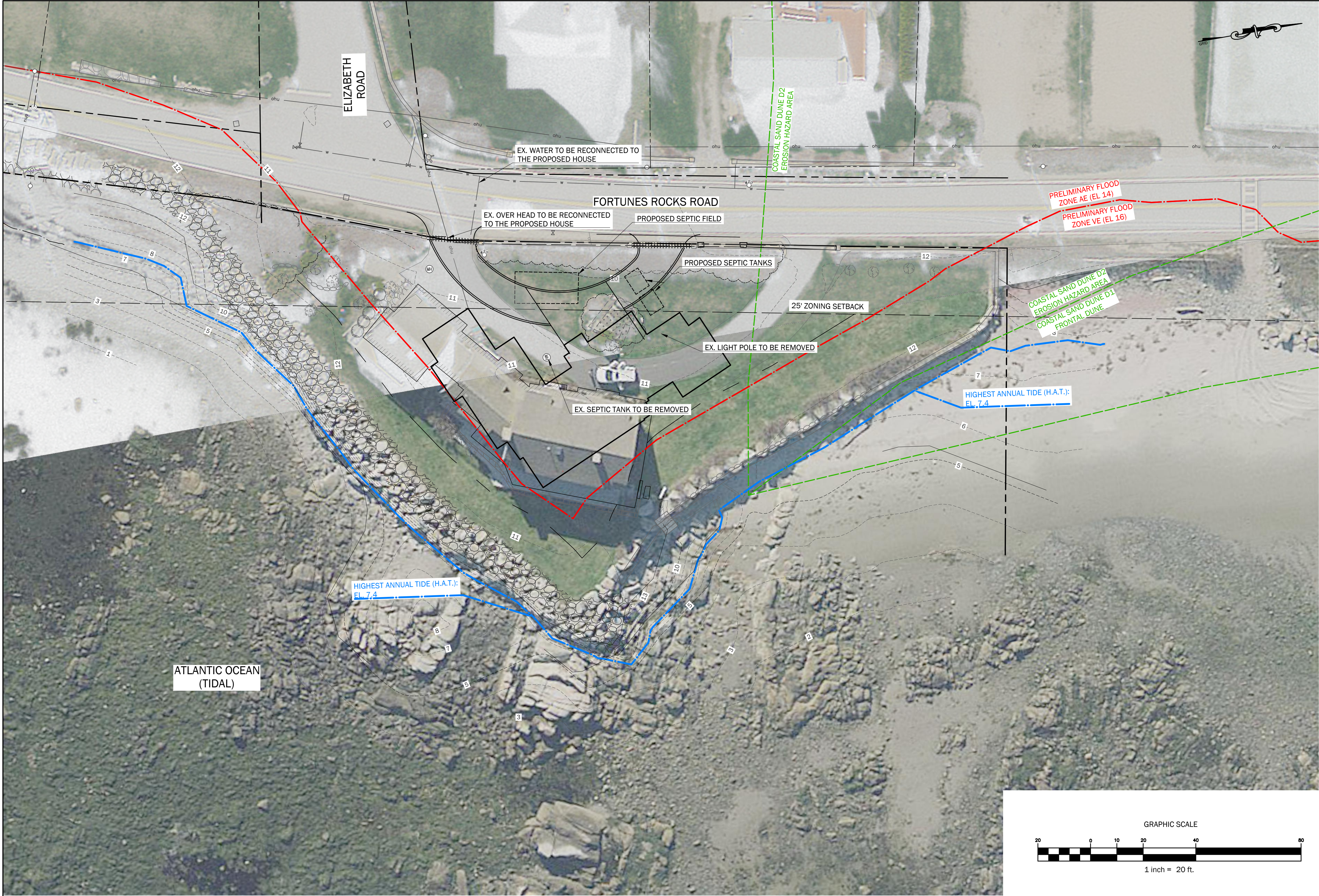
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LEGEND	
EXISTING	PROPOSED
ROAD	PROPERTY LINE
IRF or IPF	RIGHT-OF-WAY LINE
	ABUTTERS PROPERTY LINE
	TOWN LINE
	IRON ROD OR PIN FOUND
	HIGHEST ANNUAL TIDE
	BUILDING
	RIPRAP
	FIELD DETERMINED RIPRAP
	LANDSCAPE/RETAINING WALL
	EXPOSED LEDGE
	LIGHT JUNCTION
	EDGE OF LANDSCAPED AREA
	TREE
	SAND DUNE
	WATERLINE
	WATER LINE GATE VALVE
	HYDRANT
	OVERHEAD UTILITY
	STORM DRAIN CATCH BASIN
	SANITARY BED
	STAIRS
	WATER LINE SHUT-OFF VALVE
	INDEX CONTOUR
	INTERMEDIATE CONTOUR
	FLOOD ZONE
	LIMIT OF DISTURBANCE

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STATE OF MAINE
WILLIAM R. WALSH, III
No. 8204
LICENSED PROFESSIONAL ENGINEER
4/12/2024

PROPOSED HOUSE RECONSTRUCTION
99 FORTUNES ROCKS ROAD
BIDDEFORD, MAINE 04005

PREPARED FOR:
JONATHAN AND ELIZABETH BEEBE
99 FORTUNES ROCKS ROAD
BIDDEFORD, ME 04005

Rev.	Date	Description	Drawn	Check
1	12/11/2022	Biddeford Code Meeting	JDC	WDG
2	03/25/2024	New House	KRM	WDG
3	03/28/24	DEP PBR Submission	KRM	WDG
4	04/11/24	City Submission	KRM	WDG

Sheet Title:
UTILITY PLAN

Job No.: 828
Date: JULY 2023
Scale: AS SHOWN
Drawn: JDC
Checked: WRW

Sheet No.:
C3.1

PRELIMINARY - NOT FOR CONSTRUCTION

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INTRODUCTION

THE FOLLOWING PLAN FOR CONTROLLING SEDIMENTATION AND EROSION IN THIS PROJECT IS BASED ON CONSERVATION PRACTICES FOUND IN THE MAINE EROSION & SEDIMENT CONTROL BMPs MANUAL, OCTOBER 2016, AND MAINE EROSION AND SEDIMENT CONTROL PRACTICE FIELD GUIDE FOR CONTRACTORS, REVISED 2014, MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION. THE CONTRACTOR WHO IMPLEMENTS THIS PLAN SHALL BE FAMILIAR WITH THESE PUBLICATIONS AND ADHERE TO THEM AND THE PRACTICES PRESENTED HEREIN

REFERENCE IS MADE TO THE GRADING AND DRAINAGE PLANS WITHIN THE PLAN SET, SHOWING THE LOCATIONS AND TYPES OF PROPOSED MEASURES TO BE IMPLEMENTED.

GENERAL EROSION AND SEDIMENTATION CONTROL PRACTICES

THE FOLLOWING IS A LIST OF GENERAL EROSION CONTROL PRACTICES THAT WILL BE USED TO PREVENT EROSION AND SEDIMENTATION BEFORE, DURING AND AFTER THE CONSTRUCTION OF THIS PROJECT. IN ADDITION, SPECIAL CARE SHALL BE USED AT ALL TIMES TO: LIMIT DISTURBANCE AND, HENCE, EROSION

- 1) CORRECT ANY EROSION PROBLEMS IMMEDIATELY
- 2) REGULARLY MONITOR THE IMPLEMENTED PRACTICES, ESPECIALLY AFTER EVERY RAINFALL
- 3) REVEGETATE DISTURBED AREAS AS SOON AS POSSIBLE AFTER CONSTRUCTION
- 4) CONFORM TO ALL REQUIREMENTS/STANDARDS OF THE SITES MAINE DEP EROSION & SEDIMENT CONTROL BMP MANUAL.

SILT FENCE AND/OR EROSION CONTROL MIX SEDIMENT BARRIERS

SILT FENCE AND/OR EROSION CONTROL MIX SEDIMENT BARRIERS WILL BE INSTALLED ALONG THE DOWN GRADIENT SIDE OF THE PROPOSED GROUND DISTURBANCE AREAS PRIOR TO ANY CONSTRUCTION ACTIVITIES WHERE SLOPES EXCEED 8% OR THERE IS FLOWING WATER BOTH SILT FENCE AND EROSION CONTROL MATTING BERMS SHALL BE USED.

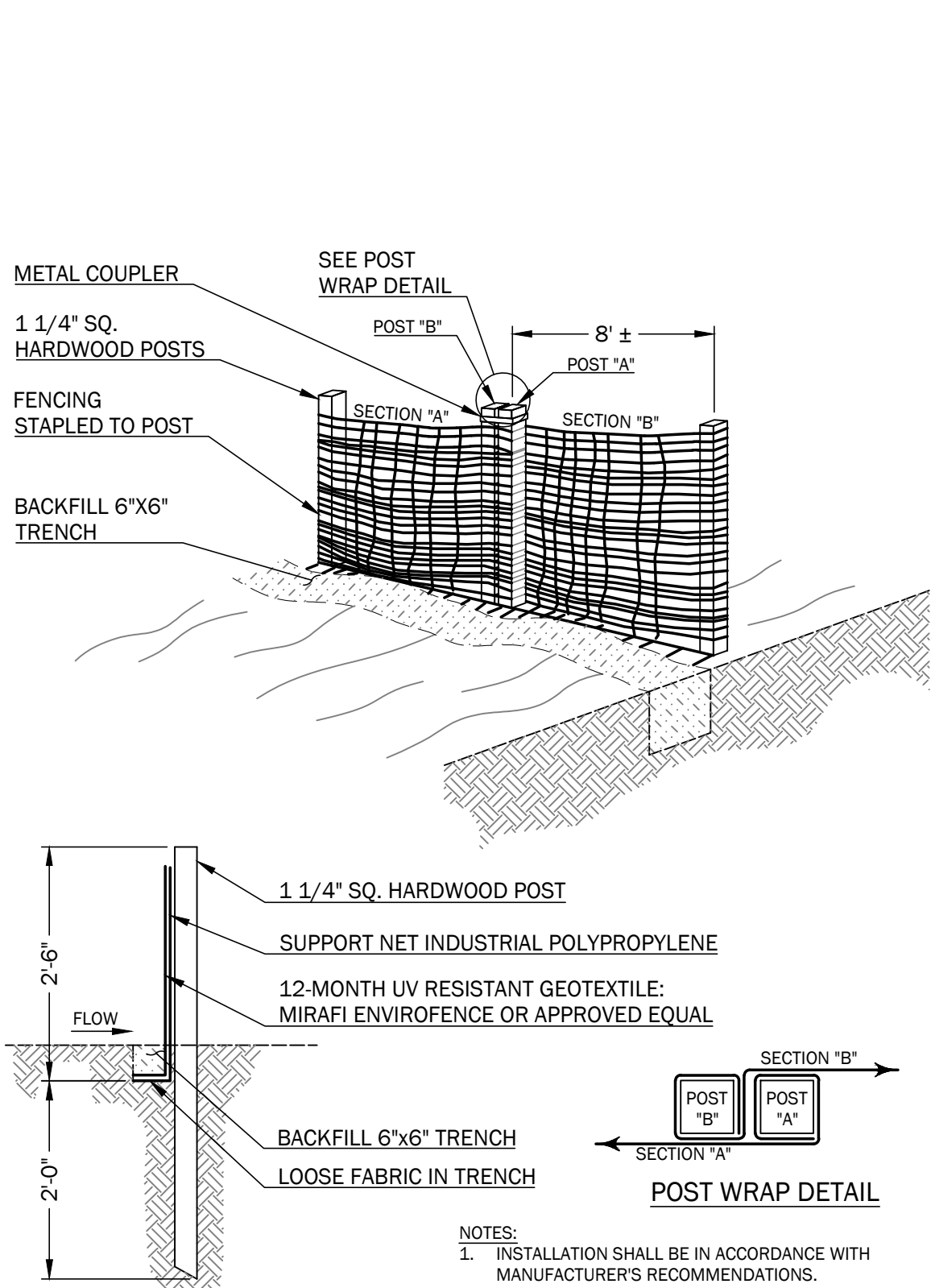
CATCH BASIN PROTECTION

CATCH BASIN PROTECTION WILL BE INSTALLED AT THE FIRST DOWNGRADIENT CATCH BASIN IN STREET ADJACENT TO ANY CONSTRUCTION ACTIVITIES AND IN ALL ONSITE CATCH BASINS UNTIL SITE HAS BEEN COMPLETELY STABILIZED.

CONSTRUCTION PHASE

THE FOLLOWING GENERAL PRACTICES WILL BE IMPLEMENTED TO PREVENT EROSION DURING CONSTRUCTION ON THIS PROJECT:

1. EROSION AND SEDIMENTATION CONTROL BMPs SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF EARTHWORK ACTIVITIES.
2. ONLY THOSE AREAS UNDER ACTIVE CONSTRUCTION WILL BE CLEARED AND LEFT IN AN UNTREATED OR UNVEGETATED CONDITION. AN AREA NO LARGER THAN WHAT CAN BE MULCHED IN ONE DAY MAY BE OPEN AT ONCE. ONCE CONSTRUCTION OF AN AREA IS COMPLETE, FINAL GRADING, LOAMING AND SEEDING SHALL OCCUR IMMEDIATELY (REFER TO "POST CONSTRUCTION REVEGETATION" SECTION). IF DURING FINAL GRADING, LOAMING AND SEEDING CAN NOT OCCUR IMMEDIATELY, IT SHALL BE DONE PRIOR TO ANY STORM EVENT AND WITHIN 15 DAYS OF COMPLETING CONSTRUCTION IN THE AREA. IF FINAL GRADING, LOAMING AND SEEDING CANNOT OCCUR WITHIN 7 DAYS, OR IF THE AREA IS NOT UNDER ACTIVE CONSTRUCTION FOR A PERIOD LONGER THAN 7 DAYS, SEE ITEM NO. 4 BELOW.
3. PRIOR TO THE START OF CONSTRUCTION IN A SPECIFIC AREA, SILT FENCING SHALL BE INSTALLED ON DOWNGRADIENT PORTIONS OF THE SITE AS LOCATED ON THE PLANS TO PROTECT AGAINST ANY CONSTRUCTION RELATED EROSION.
4. TOPSOIL WILL BE STOCKPILED WHEN NECESSARY IN AREAS WHICH HAVE MINIMUM POTENTIAL FOR EROSION AND WILL BE KEPT AS FAR AS POSSIBLE FROM EXISTING DRAINAGE AREAS AND WETLANDS. ALL STOCKPILES EXPECTED TO REMAIN LONGER THAN 7 DAYS SHALL BE:
 - A. TREATED WITH ANCHORED MULCH (WITHIN 5 DAYS OF THE LAST DEPOSIT OF STOCKPILED SOIL).
 - B. SEEDDED WITH CONSERVATION MIX AND MULCHED IMMEDIATELY.
 - C. STOCKPILES SHALL BE EITHER PLACED UPHILL OF AN EXISTING SEDIMENT BARRIER ON THE SITE OR ENCLOSED BY A HAY BALE OR SILT FENCE BARRIER THE FIRST DAY THAT STOCKPILING COMMENCES.
5. ALL DISTURBED AREAS EXPECTED TO REMAIN LONGER THAN 7 DAYS SHALL BE:
 - A. TREATED WITH STRAW AT A RATE OF 70-90 LBS. PER 1000 SQUARE FEET FROM 4/16 TO 10/1, OR AT A RATE OF 150-200 LBS. PER 1000 SQUARE FEET FROM 10/1 TO 4/15.
 - B. SEEDDED WITH CONSERVATION MIX OF PERENNIAL RYE GRASS (1.0 LBS./1000 SQ.FT.) AND MULCHED IMMEDIATELY. FROM 10/1 TO 4/15, FOLLOW THE SEEDING RATES AS OUTLINED BELOW IN SUB-SECTION 4.D. OF THE "POST CONSTRUCTION REVEGETATION" SECTION.
 - C. MONITORED EVERY TWO WEEKS UNTIL SEEDING CAN OCCUR AND REMULCHED AS NEEDED TO PROTECT SLOPES.
5. ALL GRADING WILL BE HELD TO A MAXIMUM 3:1 SLOPE WHERE PRACTICAL. GREATER SLOPES MAY BE USED WHERE THE BANKS ARE PROTECTED WITH SOFT ARMOUR MATTING, EROSION CONTROL MATTING, OR RIPRAP. ALL SLOPES WILL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY AFTER FINAL GRADING IS COMPLETE. (IT IS UNDERSTOOD THAT IMMEDIATELY MEANS WITHIN 5 DAYS OF THE COMPLETION OF WORK. SEE POST-CONSTRUCTION REVEGETATION FOR SEEDING SPECIFICATION).
6. APPLICATION RATE MUST BE 2 BALES (70-90 LBS.) PER 1,000 SQUARE FEET OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75 TO 90% OF THE GROUND SURFACE. DRIVE OVER WITH TRACKED CONSTRUCTION EQUIPMENT ON GRADES OF 5% AND LESS.
7. CONSTRUCTION TRAFFIC WILL BE DIRECTED OVER THE EXISTING SITE ENTRANCE. THE ROAD SHALL BE SWEEPED AND VACUUMED DAILY SHOULD SEDIMENT BE TRACKED ONTO IT.
8. ALL AREAS DRAINING TO A STORMWATER FILTER OR BMP SHALL BE STABILIZED PRIOR TO CONSTRUCTION OF FILTER MEDIA TO PREVENT SEDIMENT FROM CLOGGING MEDIA.



3 PREFABRICATED SILT FENCE
NOT TO SCALE

DEWATERING

1. ALL DEWATERING DISCHARGE LOCATIONS SHALL BE LOCATED ON RELATIVELY FLAT GROUND AT LEAST 75' FROM STREAMS AND 25' FROM WETLANDS. THE CONTRACTOR SHALL UTILIZE DIRTBAGS, EROSION CONTROL MIX BERMS, OR SIMILAR METHODS FOR FILTRATION OF DEWATERING AND SHALL CONFORM TO THE MAINE EROSION AND SEDIMENT CONTROL BMPs G-1, G-2, AND G-3.

POST CONSTRUCTION REVEGETATION

THE FOLLOWING GENERAL PRACTICES WILL BE IMPLEMENTED TO PREVENT EROSION AS SOON AS AN AREA IS READY TO UNDERGO FINAL GRADING:

1. A MINIMUM OF 6" OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND GRADED TO A UNIFORM DEPTH AND NATURAL APPEARANCE.
2. LAWN AREAS: "PARK MIX" GRASS SEED BY ALLEN, STERLING & LOTHROP (FALMOUTH, MAINE), OR APPROVED EQUAL.
3. MULCH SHALL BE HAY OR STRAW MULCHES THAT ARE DRY AND FREE FROM UNDESIRABLE SEEDS AND COARSE MATERIALS.
 - A. APPLICATION RATE MUST BE 2 BALES (70-90 LBS.) PER 1,000 SQUARE FEET OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75 TO 90% OF THE GROUND SURFACE.
 - B. DRIVE OVER WITH TRACKED CONSTRUCTION EQUIPMENT ON GRADES OF 5% AND LESS.
 - C. BLANKET WITH TACKED PHOTODEGRADABLE/BIODEGRADABLE NETTING ON GRADES GREATER THAN 5%.
4. HYDRO-MULCH SHALL CONSIST OF A MIXTURE OF ASPHALT, WOOD FIBRE OR PAPER FIBRE AND WATER, WHICH IS SPRAYED OVER A SEEDED AREA. HYDRO-MULCH SHALL NOT BE USED BETWEEN 10/1 AND 4/15.
5. CONSTRUCTION SHALL BE PLANNED TO ELIMINATE THE NEED FOR SEEDING BETWEEN OCTOBER 1ST AND APRIL 15TH. SHOULD SEEDING BE NECESSARY BETWEEN THESE DATES, THE FOLLOWING PROCEDURE SHALL BE FOLLOWED:
 - A. ONLY UNFROZEN LOAM SHALL BE USED.
 - B. LOAMING, SEEDING AND MULCHING WILL NOT BE DONE OVER SNOW OR ICE COVER. IF SNOW EXISTS, IT MUST BE REMOVED PRIOR TO PLACEMENT OF SEED.
 - C. WHERE PERMANENT SEEDING IS NECESSARY, ANNUAL WINTER RYE (1.2 LBS./1000 S.F.) SHALL BE SOWN INSTEAD OF THE PREVIOUSLY NOTED SEEDING RATE.
 - D. WHERE TEMPORARY SEEDING IS REQUIRED, ANNUAL WINTER RYE (2.5 LBS./1000 S.F.) SHALL BE SOWN INSTEAD OF THE PREVIOUSLY NOTED SEEDING RATE.
 - E. FERTILIZING, SEEDING AND MULCHING SHALL BE DONE ON LOAM THE DAY THE LOAM IS SPREAD.
 - F. HAY MULCH SHALL BE SECURED WITH PHOTODEGRADABLE/BIODEGRADABLE NETTING. TRACKING BY MACHINERY ALONE WILL NOT SUFFICE. WINTER MULCHING RATES, SHALL BE DOUBLE AS SPECIFIED ABOVE IN SUBSECTION 3.A OF THE "POST CONSTRUCTION REVEGETATION" SECTION, SHOULD BE APPLIED DURING THIS PERIOD.
6. FOLLOWING FINAL SEEDING, THE SITE WILL BE INSPECTED EVERY 30 DAYS UNTIL 90% COVER HAS BEEN ESTABLISHED. RESEEDING WILL BE CARRIED OUT BY THE CONTRACTOR WITHIN 10 DAYS OF NOTIFICATION BY THE DESIGN PROFESSIONAL THAT THE EXISTING CATCH IS INADEQUATE.

MONITORING SCHEDULE

THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING, MONITORING, MAINTAINING, REPAIRING, REPLACING AND REMOVING ALL OF THE EROSION AND SEDIMENTATION CONTROLS APPROPRIATE TO A QUALIFIED SUBCONTRACTOR TO DO SO. MAINTENANCE MEASURES WILL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION CYCLE. IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL, AND AT LEAST ONCE A WEEK, A VISUAL INSPECTION WILL BE MADE OF ALL EROSION AND SEDIMENTATION CONTROLS AS FOLLOWS:

1. SILT FENCE SHALL BE INSPECTED AND REPAIRED. SEDIMENT TRAPPED BEHIND THESE BARRIERS SHALL BE EXCAVATED WHEN IT REACHES A DEPTH OF 6" AND REDISTRIBUTED TO AREAS UNDERGOING FINAL GRADING.
2. CONSTRUCTION ENTRANCE SHALL BE VISUALLY INSPECTED AND REPAIRED AS NEEDED. ANY AREAS SUBJECT TO RUTTING SHALL BE STABILIZED IMMEDIATELY. IF THE VOIDS OF THE CONSTRUCTION ENTRANCE BECOME FILLED WITH MUD, MORE CRUSHED STONE SHALL BE ADDED AS NEEDED. THE PUBLIC ROADWAY SHALL BE SWEEPED AND VACUUMED SHOULD MUD BE DEPOSITED/TRACKED ONTO THEM.

STANDARDS FOR STABILIZING SITES FOR THE WINTER

THE FOLLOWING STANDARDS AND METHODOLOGIES SHALL BE USED FOR STABILIZING THE SITE DURING THE WINTER CONSTRUCTION PERIOD:

1. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES (ANY AREA HAVING A GRADE GREATER THAN 25%) - THE CONTRACTOR WILL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15TH. IF THE CONTRACTOR FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15TH, THEN THE CONTRACTOR WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.
 - A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS: BY OCTOBER 1ST THE CONTRACTOR WILL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A RATE OF 3 POUNDS PER 1000 SQUARE FEET AND THEN INSTALL EROSION CONTROL MATS OR ANCHORED HAY MULCH OVER THE SEEDING AT TWICE THE RATE AS SPECIFIED ABOVE IN SUBSECTION 3.A OF THE "POST CONSTRUCTION REVEGETATION" SECTION. THE CONTRACTOR WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS.
 - B. STABILIZE THE SLOPE WITH WOOD-WASTE COMPOST: THE CONTRACTOR WILL PLACE A SIX-INCH LAYER OF WOOD-WASTE COMPOST ON THE SLOPE BY NOVEMBER 15TH. THE CONTRACTOR WILL NOT USE WOOD-WASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.

NOTES:

1. THE EROSION CONTROL MIX SHALL CONTAIN A WELL GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4" DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH.
2. MATERIAL SHALL MEET THE FOLLOWING REQUIREMENTS
 - A. THE ORGANIC CONTENT SHALL BE BETWEEN 80 AND 100% DRY WEIGHT BASIS
 - B. PARTICLE SIZE BY WIEGHT SHALL BE 100% PASSING A 6" SCREEN AND A MAXIMUM OF 85% PASSING A 0.75" SCREEN
 - C. THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED
 - D. LARGE PORTIONS OF SILTS, CLAYS, OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX
 - E. SOLUBLE SALTS CONTENT SHALL BE <4.0 MMHOS/CM
 - F. THE pH SHOULD FALL BETWEEN 5.0 AND 8.0
3. PLACE BARRIER ALONG A RELATIVELY FLAT CONTOUR. CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES WHERE FINES CAN WASH UNDER THE BARRIER THROUGH GRASS BLADES AND BRANCHES.
4. PLACEMENT OF BARRIER SHOULD BE:
 - AT TOE OF THE SLOPE.
 - AT THE EDGE OF FROZEN GROUND, BEDROCK OR ROOTED FORESTED AREAS.
 - THE EDGE OF GRAVEL AND AREAS UNDER CONSTRUCTION.
5. SEDIMENT BARRIER SHALL NOT BE USED ADJACENT TO WETLANDS WITHOUT SILTFENCE.
6. REMOVE SEDIMENT DEPOSITS WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
7. WHEN BARRIER IS DECOMPOSED, CLOGGED WITH SEDIMENT, ERODED OR INEFFECTIVE, IT MUST BE REPLACED OR REPAIRED. THE BARRIER SHOULD BE RESHAPED AS NECESSARY.

5 SILT FENCE & EROSION CONTROL SEDIMENT BARRIER
NOT TO SCALE

- C. STABILIZE THE SLOPE WITH STONE RIPRAP: THE CONTRACTOR WILL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15TH. THE DEVELOPER'S OWNER WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY ON THE SLOPE AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.
2. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOILS - BY SEPTEMBER 15TH THE CONTRACTOR WILL SEED AND MULCH ALL DISTURBED SOILS ON THE SITE. IF THE CONTRACTOR FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE CONTRACTOR WILL TAKE ON OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.
 - A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION: BY OCTOBER 1ST THE CONTRACTOR WILL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE CONTRACTOR WILL 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 75% OF THE DISTURBED SOIL BEFORE NOVEMBER, 1, THEN THE CONTRACTOR WILL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM III OF THIS STANDARD.
 - B. STABILIZE THE SOIL WITH SOD: THE CONTRACTOR WILL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1ST. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.
 - C. STABILIZE THE SOIL WITH MULCH: BY NOVEMBER 15TH THE CONTRACTOR WILL 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 ANCHOR THE MULCH WITH NETTING OR OTHER METHOD TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.

EROSION CONTROL REMOVAL

AN AREA IS CONSIDERED STABLE IF IT IS PAVED OR IF 90% GROWTH OF PLANTED SEEDS IS ESTABLISHED. ONCE AN AREA IS CONSIDERED STABLE, THE EROSION CONTROL MEASURES CAN BE REMOVED AS FOLLOWS:

1. SILT FENCE: SILT FENCE SHALL BE DISPOSED OF LEGALLY AND PROPERLY OFF-SITE. ALL SEDIMENT TRAPPED BEHIND THESE CONTROLS SHALL BE DISTRIBUTED TO AN AREA UNDERGOING FINAL GRADING OR REMOVED AND RELOCATED OFF-SITE.
2. STABILIZED CONSTRUCTION ENTRANCE: THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE REMOVED ONCE THE COMPACTED ROADWAY BASE IS IN PLACE. STONE AND SEDIMENT FROM THE CONSTRUCTION ENTRANCE SHALL BE REDISTRIBUTED TO AN AREA UNDERGOING GRADING OR REMOVED AND RELOCATED OFFSITE.
3. MISCELLANEOUS: ONCE ALL THE TRAPPED SEDIMENTS HAVE BEEN REMOVED FROM THE TEMPORARY SEDIMENTATION DEVICES THE DISTURBED AREAS MUST BE REGRADED IN AN AESTHETIC MANNER TO CONFORM TO THE SURROUNDING TOPOGRAPHY. ONCE GRADED THESE DISTURBED AREAS MUST BE LOAMED (IF NECESSARY), FERTILIZED, SEEDDED AND MULCHED IN ACCORDANCE WITH THE RATES PREVIOUSLY STATED.

THE ABOVE EROSION CONTROLS MUST BE REMOVED WITHIN 30 DAYS OF FINAL STABILIZATION OF THE SITE. CONFORMANCE WITH THIS PLAN AND FOLLOWING THESE PRACTICES WILL RESULT IN A PROJECT THAT COMPLIES WITH THE STATE REGULATIONS AND THE STANDARDS OF THE NATURAL RESOURCES PROTECTION ACT, AND WILL PROTECT WATER QUALITY IN AREAS DOWNSTREAM FROM THE PROJECT.

MAINE CONSTRUCTION GENERAL PERMIT REQUIRED

SUBMISSION OF A MAINE CONSTRUCTION GENERAL PERMIT (MCGP) IS REQUIRED PRIOR TO COMMENCEMENT OF ANY EXCAVATION ACTIVITIES.

INSPECTION AND MAINTENANCE (APPENDIX B)

1. INSPECTION AND MAINTENANCE REQUIREMENTS: INSPECT DISTURBED AND IMPERVIOUS AREAS, EROSION AND STORMWATER CONTROL MEASURES, AREAS USED FOR STORAGE 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 AFTER A SIGNIFICANT STORM EVENT (0.5 INCHES OF RAINFALL IN A 24-HOUR PERIOD) AND PRIOR TO COMPLETION OF PERMANENT STABILIZATION MEASURES. A PERSON WITH KNOWLEDGE OF EROSION AND STORMWATER CONTROL, INCLUDING THE STANDARDS IN THE MCGP AND ANY DEPARTMENTAL COMPANION DOCUMENT TO THE MCGP, MUST CONDUCT THE INSPECTION. THIS PERSON MUST BE IDENTIFIED IN THE INSPECTION LOG. IF BEST MANAGEMENT PRACTICES (BMPs) NEED TO BE MODIFIED OR IF ADDITIONAL BMPs ARE NECESSARY, IMPLEMENTATION MUST BE STARTED BY THE END OF THE NEXT WORKIN DAY AND COMPLETED WITHIN 7 CALENDAR DAYS AND PRIOR TO ANY STORM EVENT (RAINFALL). ALL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION UNTIL AREAS AREA PERMANENTLY STABILIZED. DOCUMENTATION OF CORRECTION ACTIONS SHALL BE MAINTAINED WITH THE INSPECTION FORMS.
2. INSPECTION LOG (REPORT): A LOG (REPORT) MUST BE KEPT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME(S) AND QUALIFICATIONS OF THE PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTION, AND MAJOR OBSERVATIONS RELATING TO OPERATION OF EROSION AND SEDIMENTATION CONTROLS AND POLLUTION PREVENTION MEASURES. 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 INSPECTION LOG THE CORRECT ACTION TAKEN AND WHEN IT WAS TAKEN. THE LOG MUST BE MADE ACCESSIBLE TO THE 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 THE PERMANENT STABILIZATION.

HOUSEKEEPING (APPENDIX C)

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

NOTE: ANY SPILL OR RELEASE OF TOXIC OR HAZARDOUS SUBSTANCES MUST BE REPORTED TO THE DEPARTMENT. FOR OIL SPILLS, CALL 1-800-452-0777 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/](http://www.maine.gov/dep/spills/emergspillresp/)

2. GROUNDWATER PROTECTION: DURING CONSTRUCTION, LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAINING TO AN INFILTRATION AREA. AN "INFILTRATION AREA" IS ANY AREA OF THE SITE THAT BY DESIGN OR AS A RESULT OF SOILS, TOPOGRAPHY AND OTHER RELEVANT FACTORS ACCUMULATES RUNOFF THAT INFILTRATES INTO THE SOIL. DIKES, BERMS, SUMPS, AND OTHER FORMS OF SECONDARY CONTAMINMENT 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.

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

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

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

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

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

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

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

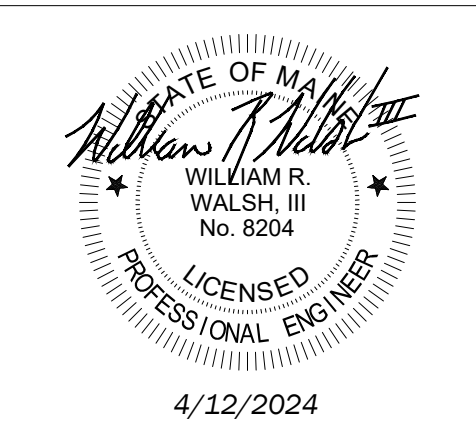
6. AUTHORIZED NON-STORMWATER DISCHARGES: IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES. WHERE ALLOWED NON-STORMWATER DISCHARGES EXIST, THEY MUST BE IDENTIFIED AND STEPS SHOULD BE TAKEN TO ENSURE THE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENT(S)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

- 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 (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 AIR CONDITIONING OR COMPRESSOR CONDENSATE;
 - UNCONTAMINATED GROUNDWATER OR SPRING WATER;
 - FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;
 - UNCONTAMINATED EXCAVATION DEWATERING (SEE REQUIREMENTS IN APPENDIX C(5));
 - POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND
 - 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 DEPARTMENTS 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.
 8. ADDITIONAL REQUIREMENTS: ADDITIONAL REQUIREMENTS MAY BE APPLIED ON A SITE-SPECIFIC BASIS.

WALSH
ENGINEERING ASSOCIATES, INC.

One Karen Dr., Suite 2A | Westbrook, Maine 04092
ph: 207.553.9898 | www.walsh-eng.com

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PROPOSED HOUSE RECONSTRUCTION

99 FORTUNES ROCK'S ROAD
BIDDEFORD, MAINE 04005

PREPARED FOR:
JONATHAN AND ELIZABETH BEEBE

99 FORTUNES ROCK'S ROAD
BIDDEFORD, ME 04005

Rev.	Date	Description	Drawn	Check
1	10/11/2023	Biddeford Code Meeting	JDC	WDG
2	03/26/2024	New House	KRM	WDG
3	03/26/24	DEP PBR Submission	KRM	WDG
4	04/11/24	City Submission	KRM	WDG

Sheet Title:

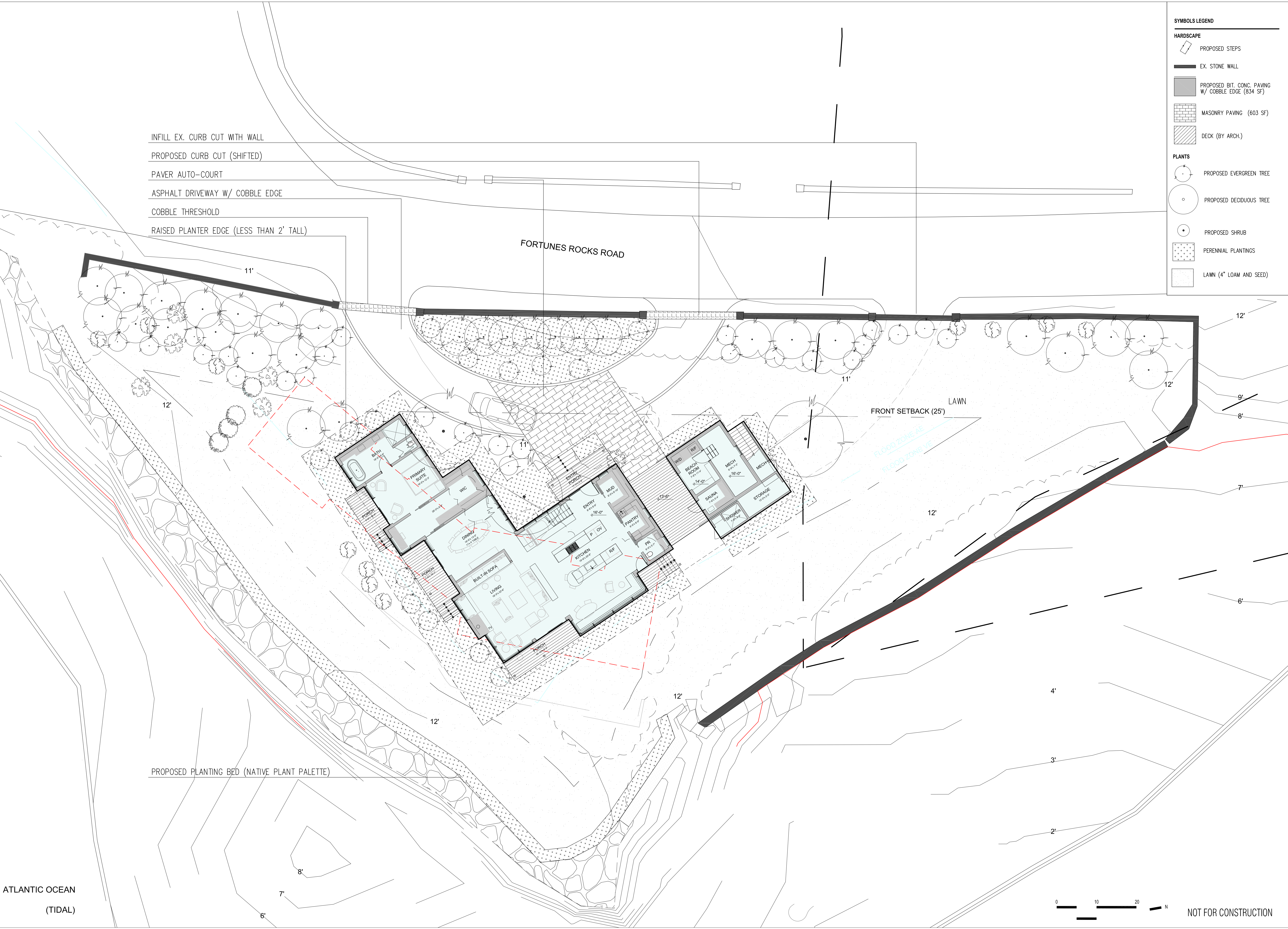
DETAILS

Job No.: 828
Date: JULY 2023
Scale: AS SHOWN
Drawn: JDC
Checked: WRW

Sheet No.:

C3.2

PRELIMINARY - NOT FOR CONSTRUCTION



ATLANTIC OCEAN
(TIDAL)

INFILL EX. CURB CUT WITH WALL
PROPOSED CURB CUT (SHIFTED)
PAVER AUTO-COURT
ASPHALT DRIVEWAY W/ COBBLE EDGE
COBBLE THRESHOLD
RAISED PLANTER EDGE (LESS THAN 2' TALL)

FORTUNES ROCKS ROAD

LAWN
FRONT SETBACK (25')

PROPOSED PLANTING BED (NATIVE PLANT PALETTE)

- SYMBOLS LEGEND**
- HARDSCAPE**
- PROPOSED STEPS
 - EX. STONE WALL
 - PROPOSED BIT. CONC. PAVING W/ COBBLE EDGE (834 SF)
 - MASONRY PAVING (603 SF)
 - DECK (BY ARCH.)
- PLANTS**
- PROPOSED EVERGREEN TREE
 - PROPOSED DECIDUOUS TREE
 - PROPOSED SHRUB
 - PERENNIAL PLANTINGS
 - LAWN (4" LOAM AND SEED)

BEEBE RESIDENCE
99 FORTUNES ROCK
BIDDEFORD, MAINE

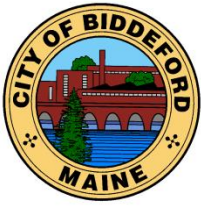
No.	Revision	Date:
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△		

revisions:
date: MARCH 27, 2024
scale: As Noted
drawn: XX
checked: XX

L1.0
LANDSCAPE
MATERIALS PLAN



NOT FOR CONSTRUCTION



CITY OF BIDDEFORD

Planning and Development Department

David C.M. Galbraith
Deputy Director/City Planner
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115

David.Galbraith@biddefordmaine.org

PLANNING BOARD STAFF REPORT

TO: Chair Patoine and Members of the Biddeford Planning Board

FROM: David C.M. Galbraith, Deputy Director/City Planner

DATE: May 6, 2024

RE: **2024.14 Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use from a movie theater to a pickle ball recreation center located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I-3 Zone.**

MEETING DATE: May 15, 2024 at 6:00 PM

1. INTRODUCTION

The City is in receipt from BVH Biddeford LLC who is seeking a Preliminary Site Plan/Conditional Use Review for the proposed change of use and the creation of a pickle ball recreation center, within the former Smitty's Cinema tenant space, located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1).



Five Points Shopping Center – 420 Alfred Road (Tax Map 20, Lot 26-1)

2024.14 Preliminary Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use from a movie theater to a pickle ball recreation center located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I-3 Zone.

Planning Board Meeting Date: May 15, 2024



Pickleball Courts proposed to be located within the existing tenant space formerly Smitty's Cinema

Kylie S. Mason, R.L.A., LEED-AP, Chief Operations Officer of Sebago Technics, the project representative and Agent for BVH Biddeford, LLC. is pleased to submit the attached Major Site Plan Application for review. As discussed in the submitted project narrative:

On behalf of BVH Biddeford, LLC, Sebago Technics Inc. is pleased to submit the attached Major Site Plan Application for review. The Applicant proposes an internal change of use for a portion of the Five Points Shopping Center located at 420 Alfred Road in Biddeford. The proposed project site is located in the I3 Commercial Industrial Zone and further identified as Lot 26-1 on the City of Biddeford Tax Map 20. The proposed project involves the redevelopment and internal change of use of two portions of the existing building, that are currently vacant, for the development of a commercial pickle ball facility and a commercial gym facility. The project site is currently fully developed with existing buildings and associated parking, lighting, landscaping, and utilities. The proposed project provides for the redevelopment of two existing suites in the large commercial complex of the Five Points Shopping Center. One redevelopment includes an approximately 23,000 square-foot portion of the shopping center previously permitted and occupied by a commercial movie theater, Smitty's Cinema, central to the western area of the existing building. The area is currently unused and has been so since the prior inhabitants ceased operations at this location. The proposed pickle ball development in this area will include six (6) pickle ball courts, a reception area with connected front office, a communal seating and bar area, and men's and women's changing rooms. The proposed layout will utilize the existing main entrance along the façade.

The proposed changes to the existing development are limited to internal changes only. The developments will utilize the existing parking, site lighting, and landscaping. The site is currently served by underground electric and telecommunications and public water and sewer. The proposed development will utilize the existing utilities, and the proposed change of use will not alter or reduce the existing demand on municipal utilities. The Applicant is not proposing any façade changes at this time, and there is no anticipated change to the existing site stormwater requirements.

The Applicants are not proposing any exterior modifications to the building or site. The proposal is for an interior remodel from a retail store for an "Amusement Center". The City's Land Use Code defines "Amusement Centers as:

AMUSEMENT CENTER: Any private, commercial premises which are maintained or operated primarily for the amusement, patronage, or recreation of the public, containing four or more table sports, pinball

2024.14 Preliminary Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use from a movie theater to a pickle ball recreation center located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I-3 Zone.

Planning Board Meeting Date: May 15, 2024

machines, video games, or similar mechanical or electronic games, whether activated by coins, tokens, or discs, or whether activated through remote control by the management.

2. PROJECT DATA/INFORMATION

1.	Applicant:	BHV Biddeford, LLC 2 Livewell Drive Kennebunk, ME 04043
2.	Owner of Property:	Same as Applicant
3.	Agent:	Kyle Mason Sebago Technics 75 John Roberts Road, Suite \$a South Portland, ME 04106
4.	Surveyor:	N/A
5.	Project Location:	420 Alfred Street
6.	Project Tax Map #/Lot #:	Tax Map 20, Lot 26-1
7.	Lot Size:	24 Acres
8.	Base Zoning:	I3
9.	Overlay Zoning:	N/A
10.	Existing Use:	
11.	Proposed Use:	Create Pickle Ball Recreation Center
12.	Approvals Required:	
13.	Uses in the Vicinity:	Commercial
14.	Waivers Needed:	a. None
18.	Waivers Granted:	a. None
22.	Other Non-City Permits Required:	
23.	LDR Attachment A: Fees Paid:	All Paid
25.	Planning Board Review History: Preliminary Site Plan/Conditional Use Review 3-20-24	

3. REVIEW PROCESS

Per City ordinance, this application is subject to Site Plan and Conditional Use (Land Development Regulations, Article VII - Conditional Use, Section 5 – Amusement Centers; Article VII Conditional Uses - Section 6 Standards & Site Plan review Article XI) review and approval by the Planning Board.

A. Site Plan Review Article XI, Section 4 – Applicability, Subsection II – Activities Subject to Major Review, Item D – Changes of Use that effect 10,000 square feet or more of floor area.

B. SEWER CAPACITY: One of the issues raised during the review of this application and the other pending applications for the Five Points Shopping Center is the capacity of the sewer line that transfers the sewer from the subject property into the City's sewer line that runs behind the shopping center. The City continues to review sewer capacity in this line, however, providing the sewer demands are the same or less than the prior tenant usage it has been determined that the sewer can accommodate the proposed use. Below is a sewer capacity comparison of the proposed pickle ball court facility compared to the prior use as a movie theater. The below sewer demand illustrates a lower sewer demand as the prior use (movie theater) so Staff does not have a concern with the proposed use or their sewer demand.

2024.14 Preliminary Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use from a movie theater to a pickle ball recreation center located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I-3 Zone.

Planning Board Meeting Date: May 15, 2024

Table A – Wastewater Demand by Facility

Facility	Rule	Gpd 1	Metric 1	Gpd 2	Metric 2	Total gpd
Tennis or Racquetball (Pickleball Facility)	300 gpd per court	300 gpd	6 courts	-	-	1,800
*Theater (Smitty's Cinema)	5 gpd per seat & 12gpd per staff	5 gpd	700 seats	12 gpd	20 employees	3,740

Article VII - Conditional Use, Section 5 – Amusement Centers

- A. In addition to the automobile parking spaces required by this ordinance, all amusement centers shall provide facilities for the parking of bicycles. Bicycle racks shall be located off the sidewalk or other pedestrian way, and away from automobile traffic lanes. A minimum of one bicycle space for every two amusement devices shall be provided.

Bicycle racks for the proposed use shall be provided per City Ordinance. This requirement has been listed in the recommended Conditions of Approval.

- B. Rest room facilities for the patrons shall be provided on the premises, of the type and number required by applicable local, state and federal codes and regulations.

Restroom facilities are being provided for the proposed entertainment use.

- C. Additional permits may be required from the municipal officers.

Article VII Conditional Uses, Section 6 Standards: The proposed use shall meet the following standards:

- A. Applications for conditional use permits must meet the standards specified in Article VI of this ordinance as well as the standards of subdivision or site review. In addition, because of the unique nature and particular concern that the general public may have relating to a conditional use in a particular zone, the Planning Board shall consider each of the applications in light of the guidelines presented below.

- B. The Planning Board shall approve, approve with conditions, or deny all applications for a conditional use permit. The applicant shall have the burden of proving that his or her application is in compliance with the requirements of this ordinance and that none of the conditions listed below would result from the approval of the conditional use permit. Failure of the applicant to submit required information shall constitute a basis for denial without a review of the remainder of the application. After the submission of a complete

2024.14 Preliminary Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use from a movie theater to a pickle ball recreation center located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I-3 Zone.

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application and a review of the required submissions, the Planning Board shall approve the application or approve it with conditions if the application meets the following standards:

1. The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws;

The proposed use will comply with all State and local Codes and Ordinances.

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;

The site is an existing developed site was previously reviewed and approved by the Planning Board.

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;

The applicant does not intend to install any additional exterior lighting and the location is in a discreet location with no known existing lighting issues.

4. The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;

There is no development proposed by this project and the site is located in a business/industrial area and the proposed use will be located within an existing, approved shopping center.

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;

The proposed use as a pickle ball facility is not expected to generate any noise, vibrations, fumes, odor, dust, glare, hours of operation, or other causes that will have any detrimental effect on surrounding uses.

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;

2024.14 Preliminary Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use from a movie theater to a pickle ball recreation center located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I-3 Zone.

Planning Board Meeting Date: May 15, 2024

The site and proposed tenant space have two points of vehicle access on to Alfred Road, which has adequate capacity to serve the proposed use.

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;

The proposed use will have a similar parking and traffic demand as was previously operating from this location without incident.

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;

Adjacent parcels are industrial/commercial. The operation should not change in any way that may impact this standard negatively given the recommended Conditions of Approval and existing Performance Standards.

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;

The proposed use is proposed to be located within an existing shopping center and will not impact the privacy of the immediate area.

10. The proposed use would be in compliance with Biddeford's Comprehensive Plan;

Although the Comprehensive Plan does not specifically address pickle ball courts or similar recreational uses, this type of use is permitted in the I-3 zone as per the Future Land Use Plan of the 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;

There are no modifications to the site or the building's exterior proposed.

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;

The property is not located in a flood zone.

13. Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;

2024.14 Preliminary Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use from a movie theater to a pickle ball recreation center located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I-3 Zone.

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The tenant space will be served by Maine Water. As previously mentioned, the shopping center is connected to one of the City's sewer lines that is close to capacity. The proposed use as a pickle ball court facility which has less sewer demand than the previous tenant and as such the applicant's proposal can be accommodated.

- 14.** Adequate provision has been made to control erosion or sedimentation;

N/A. This proposal is for an interior remodel so erosion control measures are not required.

- 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;

There are no site improvements/disturbances proposed that would affect existing stormwater system.

- 16.** The proposed water supply would meet the demands of the proposed use for fire protection purposes;

Maine Water Company serves this site and has provided an Ability to Serve letter.

- 17.** Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;

The applicant has indicated there will not be a presence of hazardous substances, and if there were, State Law must be adhered.

- 18.** The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification of the proposal;

N/A The proposed use is to be located in the middle tenant space of the existing Five Points Shopping Center. No site alterations are proposed for the site.

- 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.

The parcel is not located in a Shoreland Zone.

4. WAIVERS REQUESTED / REQUIRED: Article XI, Full Site Plan Review.

Staff Recommendation: Given there are no building expansions proposed and not increase in impervious surface proposed Staff recommend the Board grant this waiver which says that sufficient information has been provided to consider this application for review.

5. STAFF RECOMMENDATION

2024.14 Preliminary Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use from a movie theater to a pickle ball recreation center located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I-3 Zone.

Planning Board Meeting Date: May 15, 2024

This application is for Site Plan Review & Conditional Use Application for a pickle ball court facility. Staff has reviewed the application

Recommend that if the Planning Board approves the Conditional Use Permit it be approved with the following minimum conditions of approval:

- 1. Standard Conditions of Approval apply.
- 2. The applicant shall obtain all other pertinent local, state and federal permits/licenses/insurance such as building, electrical, plumbing, etc., prior to commencing business.
- 3. A bike rack shall be provided for the proposed use per City Ordinance.
- 4. All conditions previously approved by the Planning Board for uses located within the Five Points Shopping Center are hereby reaffirmed.

6. SAMPLE MOTIONS:

I. Motion to waive Article XI, Full Site Plan Review. I motion to waive Article XI, full site plan review, as no site improvements are being made.

II. Motion to approve the Preliminary Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use and develop a pickle ball recreation center, within the former Smitty’s Cinema tenant space, located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I-3 Zone.

III. Motion to Table the Preliminary Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use and develop a pickle ball recreation center, within the former Smitty’s Cinema tenant space, located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I3 Zone, for the following reasons: .

- a) _____
- b) _____
- c) _____

IV. Motion to deny Preliminary Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use and develop a pickle ball recreation center, within the former Smitty’s Cinema tenant space, located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I3 Zone, based upon the following reasons:

- a) _____
- b) _____
- c) _____

2024.14 Preliminary Site Plan/Conditional Use Review for BVH Biddeford, LLC to change the use from a movie theater to a pickle ball recreation center located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1) / in the I-3 Zone.

Planning Board Meeting Date: May 15, 2024

ATTACHMENTS

1. Conditional Use Permit Application Package
2. Draft Findings of Fact and Conclusions of Law



Major Site Plan Application

Gym and Pickleball Facility

Five Points Shopping Center

Biddeford, ME

Prepared for:
BVH Biddeford, LLC
2 Livewell Drive
Kennebunk, ME 04043

Prepared by:
Sebago Technics
75 John Roberts Rd., Suite 4A
South Portland, ME 04106

April 2024



April 29, 2024
05142-01

Mr. David Galbraith
City Planner
205 Main Street
Biddeford, ME 04005

Site Plan Review – Internal Change of Use
Pickleball Facility and Gym Facility
Five Points Shopping Center, Biddeford

Dear David:

On behalf of BVH Biddeford, LLC, Sebago Technics Inc. is pleased to submit the attached Major Site Plan Application for review. The Applicant proposes an internal change of use for a portion of the Five Points Shopping Center located at 420 Alfred Road in Biddeford. The proposed project site is located in the I3 Commercial Industrial Zone and further identified as Lot 26-1 on the City of Biddeford Tax Map 20. The proposed project involves the redevelopment and internal change of use of two portions of the existing building, that are currently vacant, for the development of a commercial pickleball facility and a commercial gym facility.

The project site is currently fully developed with existing buildings and associated parking, lighting, landscaping, and utilities. The proposed project provides for the redevelopment of two existing suites in the large commercial complex of the Five Points Shopping Center.

One redevelopment includes an approximately 23,000 square-foot portion of the shopping center previously permitted and occupied by a commercial movie theater, Smitty's Cinema, central to the western area of the existing building. The area is currently unused and has been so since the prior inhabitants ceased operations at this location. The proposed pickleball development in this area will include six (6) pickleball courts, a reception area with connected front office, a communal seating and bar area, and men's and women's changing rooms. The proposed layout will utilize the existing main entrance along the façade.

The other redevelopment includes an approximately 10,000 square-foot portion of the shopping center previously permitted and occupied by a gym facility, Planet Fitness, in the southwestern most area of the existing building. The area is currently unused and has been so since the prior inhabitants ceased operations at this location. The new proposed gym facility

will utilize most of the prior gym's layout including the entryway and front desk area. The locker rooms will remain as previously approved with upgrades to the fixtures.

The proposed changes to the existing development are limited to internal changes only. The developments will utilize the existing parking, site lighting, and landscaping. The site is currently served by underground electric and telecommunications and public water and sewer. The proposed development will utilize the existing utilities, and the proposed change of use will not alter or reduce the existing demand on municipal utilities. The Applicant is not proposing any façade changes at this time, and there is no anticipated change to the existing site stormwater requirements.

We look forward to discussing the proposed development in more detail with the Planning Board at the next meeting. Upon reviewing this application, please reach out with any questions or requests for additional information. Thank you for your time and consideration.

Sincerely,

SEBAGO TECHNICS, INC.

A handwritten signature in black ink, reading "Kylie S. Mason". The signature is fluid and cursive, with the first name "Kylie" and last name "Mason" clearly legible.

Kylie S. Mason, R.L.A., LEED-AP
Chief Operations Officer
Maine Licensed Landscape Architect

KSM/JTG

Enc.

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Exhibit 3	Financial and Technical Capacity
Exhibit 4	Abutters
Exhibit 5	Natural Resources
Exhibit 6	Stormwater Management
Exhibit 7	Landscaping
Exhibit 8	Traffic
Exhibit 9	Utilities
Exhibit 10	Standards
Exhibit 11	Site Photographs

Site Plan



City of Biddeford – Planning Department

Planning Board Application

P.O. Box 586, 205 Main Street Biddeford, Maine 04005
207-284-9115

Type of Application:

- | | | |
|--|--|--------------------------------------|
| ☐ Shoreland Zoning Permit | ☒ Site Plan Review | ☐ Extraction |
| ☐ Conditional Use Permit | ☐ Subdivision | ☐ Private Way |
| ☐ Other: _____ | | |

Applicant Information:

Name: BVH Biddeford, LLC
Mailing Address: 2 Livewell Drive, Kennebunk, ME 04043
Telephone: 207-985-5132
Email: tony@atlantichospitality.net

What is your legal interest in the property?

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

Owner's Information:

Name: Same as Applicant
Mailing Address: _____
Telephone: _____
Email: _____

Agent's Information:

Name: Kylie Mason, RLA
Mailing Address: 75 John Roberts Road, Suite 4A, South Portland, ME 04106
Telephone: 207-200-2071
Email: kmason@sebagotechnics.com

Engineer/Surveyor's Information:

Name: _____
Mailing Address: _____
Telephone: _____
Email: _____

Project Location and Lot Information:

Street Address: 420 Alfred Road Drainage Watershed: _____
Tax Map: 20 Lot: 26-1
Current Zoning: I3 Commercial Industrial Shoreland Zoning: N/A
Size of Lot: 24 ☒ acres ☐ s.f. Lot Frontage: 775 ft
Existing Use of Property: _____

Property currently serviced by:

- | | | | |
|---|--|--|--|
| ☒ City Road | ☒ Public Sewer | ☒ Public Water | ☒ Public Trash |
| ☐ Private Road | ☐ Septic System | ☐ Private Well | ☐ 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

Is the project within the 100-year floodplain? ☐ (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:

Internal use change for development of a pickleball recreation center.

Property to be Serviced by:

☒ City Road ☒ Public Sewer ☒ Public Water ☒ Public Trash
☐ Private Road ☐ Septic System ☐ Private Well ☐ Private Hauler

Limits of Disturbance: 0 _____ ☐ acres ☒ s.f.

Net change in impervious cover: 0 _____ ☐ acres ☒ s.f.

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

Is the project proposing a new Private or Public Road? ☐ (Yes, Private) ☐ (Yes, Public) ☒ (No)

Is this project within the Urbanized Area/MS4 (see [City Drainage Map](#)) ☐ (Yes) ☒ (No)

Is the project proposing any Stormwater facilities/BMPs? ☐ (Yes) ☒ (No)

Will a Traffic Movement Permit (TMP) be required?: ☐ (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 structure: 0 _____

Total new square feet paving/parking: 0 _____

Waiver Requests (attach details):

1. _____
2. _____
3. _____
4. _____
5. _____

Required Submittal 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 Department – 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. Engineering Plans, as required.
- F. Stormwater Management Report, as required.

Fees (Due at time of Submission):

- \$75 Nonrefundable Administration Fee is required for every 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 its 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 the review for special studies, legal review costs, and/or engineering review.
- I understand that by submitting an 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.

Will the proposed project cause 1 acre or more of site disturbance?: ☐ (Yes) ☒ (No)

- If Yes, applicant is responsible for any required Maine Construction General Permits and shall comply with the requirements of DEP Chapter 500 Stormwater Regulations, as they apply.

Signature of Applicant:

Anthony J. Curo SR

Date

2/19/24

Signature of Property Owner:

Anthony J. Curo SR
CHIEF Development OFFICER

Date

2/19/24

DIGITAL SUBMITTAL REQUIREMENTS FOR ALL SUBMITTALS:

- A) PDF OF SIGNED APPLICATION
- B) PDFs OF ALL DRAWING SETS AND OTHER REQUIRED SUBMITTAL ATTACHMENTS NOTED ABOVE

HARD-COPY SUBMITTAL REQUIREMENTS FOR PLANNING BOARD APPLICATIONS:

- A) SEVEN (7) FULL-SIZE PAPER COPIES OF DRAWING SETS

DIGITAL SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) INDIVIDUALLY NAMED PDFs OF EACH DRAWING (NOT A COMBINED PDF SET)
 - Individual Drawing PDF Naming Format: 'PROJECT/SHEETSET NAME\INDIVIDUAL DRAWING NAME.pdf'
- B) PDF COPIES OF ALL PERMIT APPROVALS, APPLICATIONS, REPORTS, NARRATIVES, LETTERS, ETC.
- C) FINAL CAD REFERENCE FILES IN DWG FORMAT (SURVEY & PROPOSED DESIGN LINEWORK)
 - All drawings & CAD reference files must be to-scale and within the following coordinate systems:
 - MAINE STATE PLANE WEST NAD83 (Horizontal Datum) & NAVD88 (Vertical Datum)

HARD-COPY SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) THREE (3) FULL-SIZE PAPER COPIES OF INDIVIDUAL DRAWINGS REQUIRING BOARD SIGNATURE
- B) ONE (1) FULL-SIZE PAPER COPY OF ENTIRE DRAWING SET FOR ENGINEERING RECORDS

PLEASE CONFIRM WITH PLANNING STAFF FOR CLARIFICATION

Exhibit 1

Right Title and Interest

Exhibit 1 - Title, Right or Interest

The subject parcel is owned by BVH Biddeford, LLC as evidenced by warranty deed and quitclaim deed recorded with the York County Registry of Deeds. Please see this Exhibit for a copy of the applicable deeds.

11

QUITCLAIM DEED

Biddeford Shopping Center Limited Partnership, a Maine limited partnership, with a mailing address c/o Picerne Real Estate Group, 75 Lambert Lind Highway, Warwick, Rhode Island 02886 (the "Grantor"), for consideration paid, grants to BVH Biddeford, LLC, a Maine limited liability company, (the "Grantee") with a mailing address of 184 Marlborough Street, Boston, Massachusetts 02116, with QUITCLAIM COVENANTS:

That certain tract or parcel of land, together with the buildings and improvements thereon, located at 416-420 Alfred Street in the Town of Biddeford, County of York, State of Maine, and more fully described on Exhibit A attached hereto and by this reference incorporated herein.

Subject to restrictions, easements, covenants and other matters of record, if any, to the extent the same are in force and effect.

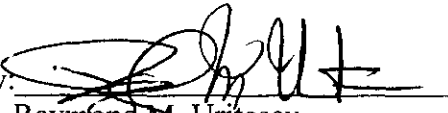
Subject to taxes assessed April 1, 2004, not yet due and payable.

IN WITNESS WHEREOF, Biddeford Shopping Center Limited Partnership has caused this Quitclaim Deed to be executed as of this 23rd day of June, 2004, by its general partner duly authorized.

MAINE R.E. TRANSFER TAX PAID

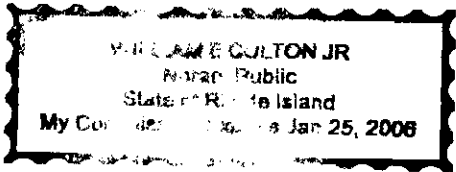
Biddeford Shopping Center Limited Partnership

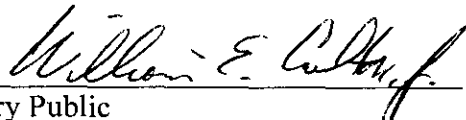
By: Kelly & Picerne, Inc.,
its General Partner

By: 
Raymond M. Uritescu
Executive Vice President

STATE OF RHODE ISLAND
COUNTY OF KENT

In WARWICK, in said County on the 23rd day of June, 2004, before me personally appeared the within named Raymond M. Uritescu, Executive Vice President of Kelly & Picerne, Inc., a Rhode Island corporation, general partner of Biddeford Shopping Center Limited Partnership, a Maine limited partnership, to me known and known by me to be the party executing the foregoing instrument and he acknowledged said instrument by him executed to be his free act and deed, the free act and deed of Kelly & Picerne, Inc. and the free act and deed of said Biddeford Shopping Center Limited Partnership.




Notary Public
Printed Name: _____
My Commission Expires: _____

#607715v1

SEAL

EXHIBIT A

) That certain parcel or tract of land with all buildings and improvements situated on the northerly side of Alfred Road in the City of Biddeford, County of York, State of Maine and is bounded and described as follows:

Beginning at a concrete monument situated 70.00 feet northerly of and perpendicular to p.c. station 818+22.01, as shown on Maine State Highway Commission Right of Way Map State Highway "U" Biddeford, York County, Federal Aid Project no. F6360 (2) June 1948 scale 1--50' file no. 16-71;

Thence running S89°-58'-00"W along the northerly street line of Alfred Road for a distance of 109.23 more or less feet to a corner in the southerly line of property now or formerly belonging to Boston and Maine Railroad;

Thence running northeasterly bounding northwesterly by property now or formerly belonging to Boston and Maine Railroad, curving to the left along the arc of a circle having a radius of 9204.62 feet, a central angle of 2°-30'-48" for an arc distance of 403.76 feet to a point of tangency, the chord of said arc forming an interior angle of 41°-21'-53" with the previously described line;

Thence running N47°-20'-43"E bounding northwesterly by said Boston and Maine Railroad property for a distance of 614.94 feet to a point of curvature;

Thence running northeasterly bounding northwesterly by said Boston and Maine Railroad property, curving to the right along the arc of a circle having a radius of 8013.63 feet, a central angle of 04°-55'-15" for an arc distance of 688.25 feet to a point of tangency;

) Thence running N52°-15'-58"E bounding northwesterly by said Boston and Maine Railroad property for a distance of 237.04 feet to an iron pipe at a corner;

Thence running S39°-00'-32"E bounding northeasterly in part by property now or formerly belonging to the Central Maine Power Company, in part by property now or formerly belonging to Richard P. And Joan A. Camire and in part by property now or formerly belonging to Leo P. and Gertrude L. Michaud for a distance of 581.20 feet more or less to a concrete monument at a corner;

Thence running S50°-58'-35"W bounding southeasterly in part by property now or formerly belonging to owners unknown, in part property now or formerly belonging to Pauline C. Berry or owner unknown, in part by property now or formerly belonging to Michael J. And Deidre Donovan, in part by property now or formerly belonging to Sandra A. Girard and in part by property now or formerly belonging to Albert F. and Rowena F. Gardella for a distance of 565.99 feet to an angle;

Thence running S20°-48'-01"W bounding southeasterly by property now or formerly belonging to Richard E. and Mary Moore for a distance of 169.69 feet to an iron pipe at an angle;

Thence running S00°-30'-55"E bounding easterly by said Moore property for a distance of 300.28 feet to remains of an iron pipe at a corner in the northerly street line of Alfred Road;

) Thence running S87°-23'-33"W along the northerly street line of Alfred Road for a distance of 301.99 feet to a corner;

EXHIBIT A - continued

) Thence running N02°-59'-00"W along the northerly street line of Alfred Road for a distance of 4.00 feet to a corner;

Thence running S87°-01'-00"W along the northerly street line of Alfred Road for a distance of 337.99 feet to a corner;

Thence running S87°-40'-00"W along the northerly street line of Alfred Road for a distance of 258.00 feet to a corner;

Thence running N48°-51'-26"E along the northerly street line of Alfred Road for a distance of 55.83 feet to a corner;

Thence running S89°-16'-30"W along the northerly street line of Alfred Road for a distance of 372.34 feet to the point and place of beginning;

Said parcel being further shown on a plan entitled "*ALTA/ACSM Land Title Survey, 5 Points Shopping Center, Route 111, Biddeford, Maine, made for Piceme Real Estate,*" dated August 13, 2002, prepared by Owen Haskell, Inc.

) **EXCEPTING** such portion of the above premises as was taken by the State of Maine, Department of Transportation pursuant to a Notice of Layout and Taking, dated February 24, 2003 and recorded in the York County Registry of Deeds in Book 12616, Page 54.

However bounded and described, meaning and intending to convey and hereby conveying the same premises conveyed by Flash Island, Inc. to Biddeford Shopping Center Limited Partnership by Warranty Deed dated October 2, 2003 and recorded with the York County Registry of Deeds in Book 13553, Page 166.

Received York SS
07/01/2004 2:00PM
REGISTER OF DEEDS

Debra L. Anderson

Todd H. Whilton, Esq.
Eckert Seamans Cherin & Mellott, LLC
One International Place, 18th Floor
Boston, MA 02110

↗
3p40



BK 17257 PGS 561 - 564
INSTR # 2016022971
RECEIVED YORK SS

06/20/2016 03:57:04 PM
DEBRA ANDERSON
REGISTER OF DEEDS

Space above for recording information

**QUITCLAIM DEED
(With Covenant)**

KNOW ALL PERSONS BY THESE PRESENTS, that **BVH BIDDEFORD, LLC**, a Maine limited liability company with a principal place of business located in Kennebunk, County of York and State of Maine, in consideration of One Dollar and other valuable considerations, hereby grants to **BIDDEFORD REALTY HOLDINGS, LLC**, a Maine limited liability company, with a principal place of business in Charlestown, Suffolk County, Commonwealth of Massachusetts (with a mailing address of One Thompson Square, Suite 205, Charlestown, Massachusetts 02129) with **QUITCLAIM COVENANTS**, the following described real estate, situated in the City of Biddeford, in the County of York and State of Maine:

A thirty-seven percent (37%) interest in and to that certain lot or parcel of land, together with the buildings and improvements thereon, located at 416-420 Alfred Street, in Biddeford, York County, Maine, said lot or parcel of land being more particularly described in Exhibit A attached hereto and incorporated herein by reference.

IN WITNESS WHEREOF the said BVH BIDDEFORD, LLC has caused this instrument to be executed by Timothy Harrington, its Manager, duly authorized, this

27, day of May, 2016.

BVH BIDDEFORD, LLC

By: Timothy Harrington, Manager

Dustin Boston
WITNESS

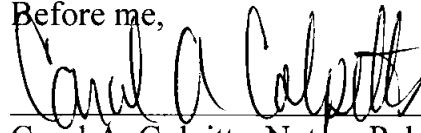
No R.E. Transfer Tax Paid

STATE OF MAINE
YORK, ss.

May 27, 2016

Then personally appeared the above-named Timothy Harrington, Manager of BVH BIDDEFORD, LLC and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said Company, before me,

Before me,



Carol A. Colpitts, Notary Public

My commission expires: _____

SEAL

Carol A. Colpitts
NOTARY PUBLIC
State of Maine
My Commission Expires
January 1, 2021

Exhibit A
(416-420 Alfred Street, Biddeford)

A certain lot or parcel of land with all buildings and improvements situated on the northerly side of Alfred Road in the City of Biddeford, County of York and State of Maine, and is bounded and described as follows:

Beginning at a concrete monument situated 70.00 feet northerly of and perpendicular to p.c. station 818+22.01, as shown on Maine State Highway Commission Right of Way Map State Highway "U" Biddeford, York County, Federal Aid Project No. F6360(2) June 1948 scale 1—50 file no. 16-71;

Thence running S 89° 58' 00" W along the northerly street line of Alfred Road for a distance of 109.23 more or less feet to a corner in the southerly line of property now or formerly belonging to Boston and Maine Railroad;

Thence running northeasterly bounding northwesterly by property now or formerly belonging to Boston and Maine Railroad, curving to the left along the arc of a circle having a radius of 9204.62 feet, a central angle of 2° 30' 48" for an arc distance of 403.76 feet to a point of tangency, the chord of said arc forming an interior angle of 41° 21' 53" with the previously described line;

Thence running N 47° 20' 43" E bounded northwesterly by said Boston and Maine Railroad property for a distance of 614.94 feet to a point of curvature;

Thence running northeasterly bounding northwesterly by said Boston and Maine Railroad property, curving to the right along the arc of a circle having a radius of 8013.63 feet, a central angle of 04° 55' 15" for an arc distance of 688.25 feet to the point of tangency;

Thence running N 52° 15' 58" E bounding northwesterly by said Boston and Maine Railroad property for a distance of 237.04 feet to an iron pipe at a corner;

Thence running S 39° 00' 32" E bounding northeasterly in part by property now or formerly belonging to the Central Maine Power Company, in part by property now or formerly belonging to Richard P. and Joan A. Camire and in part by property now or formerly belonging to Leo P. and Gertrude L. Michaud for a distance of 581.20 feet more or less to a concrete monument at a corner;

Thence running S 50° 58' 35" W bounding southeasterly in part by property now or formerly belonging to owners unknown, in part by property now or formerly belonging to Pauline C. Berry or owner unknown, in part by property now or formerly belonging to Michael J. and Deidre Donovan, in part by property now or formerly belonging to Sandra A. Girard and in part

by property now or formerly belonging to Albert F. and Rowena F. Gardella for a distance of 565.99 feet to an angle;

Thence running S 20° 48' 01" W bounding southeasterly by property now or formerly belonging to Richard E. and Mary Moore for a distance of 169.69 feet to an iron pipe at an angle.

Thence running S 00° 30' 55" E bounding easterly by said Moore property for a distance of 300.28 feet to remains of an iron pipe at a corner in the northerly street line of Alfred Road;

Thence running S 87° 23' 33" W along the northerly street line of Alfred Road for a distance of 301.99 feet to a corner;

Thence running N 02° 59' 00" W along the northerly street line of Alfred Road for a distance of 4.00 feet to a corner;

Thence running S 87° 01' 00" W along the northerly street line of Alfred Road for a distance of 337.99 feet to a corner;

Thence running S 87° 40' 00" W along the northerly street line of Alfred Road for a distance of 258.00 feet to a corner;

Thence running N 48° 51' 26" E along the northerly street line of Alfred Road for a distance of 55.83 feet to a corner;

Thence running S 89° 16' 30" W along the northerly street line of Alfred Road for a distance of 372.34 feet to the point and place of beginning;

Said parcel being further shown on a plan entitled "ALTA/ACSM Land Title Survey, 5 Points Shopping Center, Route 111, Biddeford, Maine, made for Picerne Real Estate" dated August 13, 2002, prepared by Owen Haskell, Inc.

EXCEPTING such portion of the above premises as was taken by the State of Maine, Department of Transportation pursuant to a Notice of Layout and Taking, dated February 24, 2003 and recorded in the York County Registry of Deeds in Book 12616, Page 54.

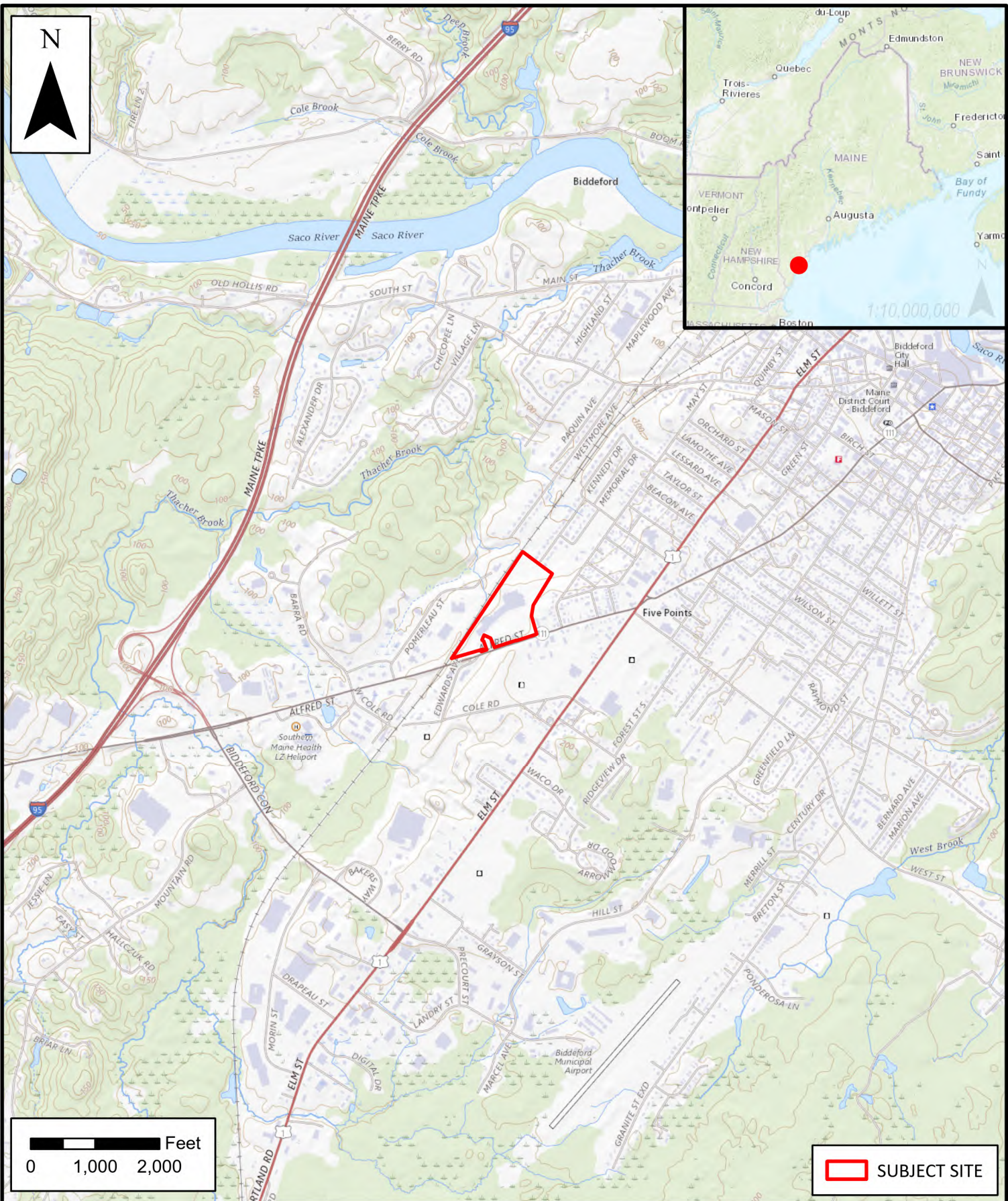
Being the same premises conveyed to BVH Biddeford, LLC by deed from Biddeford Shopping Center Limited Partnership dated June 23, 2004 and recorded in the York County Registry of Deeds in Book 14143, Page 173.

Exhibit 2

Location Map

Exhibit 2 – Location Map

Please see the enclosed maps: a location map showing the proposed development in relation to existing streets.



SEBAGO
TECHNICS

WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd. - Suite 4A
South Portland, ME 04106
Tel: 207-200-2100

LOCATION MAP 5 POINTS PICKLEBALL

LOCATION:
FIVE POINTS SHOPPING CENTER
BIDDEFORD, ME

INFORMATION:
MAINE GEOLIBRARY
USGS QUADRANGLE

SCALE: 1:24,000
DATE: 3/5/2024

Exhibit 3

Financial Capacity

Exhibit 3 – Financial and Technical Capacity

Financial Capacity

The proposed development will be self-financed by the applicant, BVH Biddeford, LLC. The applicant has the capacity to finance the estimated cost of all proposed on-site development.

Technical Capacity

BVH Biddeford, LLC is a developer with years of experience with commercial development in Southern Maine. Their team has been designing, owning, and operating the Five Points Shopping Center for around 20 years.

Sebago Technics, Inc. (STI) is a multi-disciplinary engineering firm with over 35 years of experience that offers a wide range of services specializing in land development, planning, permitting and engineering design services. We maintain a staff of multi-disciplinary professionals to provide services in the areas of general civil engineering, road and utility infrastructure design, construction management, permitting, landscape architecture, soil science, wetlands science, land surveying, and environmental services.

Exhibit 4

Abutters

Exhibit 4 – Abutters

Please see below for a map and table of the location and ownership of the abutters within 200 feet of the site.

Owner	Address	City/ State/ Zip
STOOPS, BEVERLY,	406 ALFRED ST,	BIDDEFORD, ME 04005
LABRECQUE, BRYAN P & LISA M,	408 ALFRED ST,	BIDDEFORD, ME 04005
TSFP, FBO CITY OF BIDDEFORD	205 MAIN ST,	BIDDEFORD, ME 04005
BVH BIDDEFORD, LLC &, HD LAWRENCE REALTY, LLC	2 LIVEWELL DRIVE, SUITE 201,	KENNEBUNK, ME 04043
CURRO, SANDRA A.B & ANTHONY S,	182 MAY ST,	BIDDEFORD, ME 04005
KRASSE, JENNIFER EILEEN, STUART, JESSIE LIBBEY	180 MAY ST ,	BIDDEFORD, ME 04005
SALVAS, STEPHANIE A,	17 PLYMOUTH DR,	BIDDEFORD, ME 04005
BATCHELDER, HARLEE A., KEMP, CHRISTOPHER M.	20 PLYMOUTH DR,	BIDDEFORD, ME 04005
BVH BIDDEFORD, LLC &, HD LAWRENCE REALTY, LLC	2 LIVEWELL DRIVE SUITE 201,	KENNEBUNK, ME 04043
DUTREMBLE, ALAN J & NANCY A,	69 WESTMORE AVE,	BIDDEFORD, ME 04005
WESTVIEW PLAZA INC, C/O ROBERGE CONSTRUCTION CO	PO BOX 18,	BIDDEFORD, ME 04005
ZACCAI, ADRIENNE,	74 WESTMORE AVE,	BIDDEFORD, ME 04005
GARDELLA, ALBERT F &, RONALD, A & STEPHANIE A	186 MAY ST,	BIDDEFORD, ME 04005
SPUR PARK, LLC,	2 MARINERS WAY,	KENNEBUNK, ME 04043
419 ALFRED STREET LLC,	PO BOX 1565 ,	BIDDEFORD, ME 04005
JH HOLDINGS, LLC,	42 GRAY RD,	CUMBERLAND, ME 04021
PARK ONE ELEVEN,	409 ALFRED ST,	BIDDEFORD, ME 04005
KAPLAN, MICHAEL TRUSTEE, FIRST EDSONS REALTY TRUST	3 LINDA LN,	NAHANT, MA 01908
GREENWOOD CEMETERY,	PO BOX 1323,	BIDDEFORD, ME 04005
TARDIF, JUSTIN M &, TOURIGNY, CHANTEL E	21 PLYMOUTH DR,	BIDDEFORD, ME 04005
BOISSONNEAULT, JOANNE L &, PETER J	19 PLYMOUTH DR,	BIDDEFORD, ME 04005
KIMBOROWICZ, DAVID W, KIMBOROWICZ, MICHELLE A	24 PLYMOUTH DR,	BIDDEFORD, ME 04005
TAFFE, CALLIE M,	241 HILLS BEACH RD,	BIDDEFORD, ME 04005
CITY OF BIDDEFORD, MEMORIAL PARK MAY ST	PO BOX 586,	BIDDEFORD, ME 04005
NKC, LLC,	25 EDWARDS AVE,	BIDDEFORD, ME 04005
NYANGWARA, GEORGE M &, MORARA, JULIA K	15 EDWARDS AVE,	BIDDEFORD, ME 04005
CENTRAL MAINE POWER CO, C/O AVANGRID MANAGEMENT CO - LOCAL TAX	ONE CITY CENTER 5TH FLOOR,	PORTLAND, ME 04101
STELLA HOLDINGS, LLC,	5 ALFRED ST SUITE 102,	BIDDEFORD, ME 04005

STELLA HOLDINGS, LLC,	5 ALFRED ST SUITE 102,	BIDDEFORD, ME 04005
LINWOOD ENTERPRISES, LLC,	101 EAST AVE,	LEWISTON, ME 04240
SEASIDE REALTY GROUP, LLC,	PO BOX 2563,	KENNEBUNKPORT, ME 04046
PARK ONE ELEVEN INC,	30 KETTLE COVE RD,	CAPE ELIZABETH, ME 04107
NEW HERITAGE BUILDERS, INC.,,	198 SACO AVE,	OLD ORCHARD BEACH, ME 04064

Exhibit 5

Natural Resources

Exhibit 5 – Natural Resources

Flooding

The project site falls entirely outside of FEMA identified flood zones in accordance with the Flood Insurance Rate Map (FIRM) for the City of Biddeford (Community Panel 2301450003B, dated May 15, 1984). Please see the attached flood map.

Wetlands

The proposed development is limited to internal changes to the existing building, and thus does not include any wetland area.



ELEVATION REFERENCE MARKS		
REFERENCE MARK	ELEVATION IN FT. (NGVD) ¹	DESCRIPTION OF LOCATION
RM 1	65.51	Standard disk, stamped TT-40TDA, set on north side of South Street bridge over Swan Pond Brook.
RM 2	84.93	Charcoal X on rim of fire hydrant on north side of South Street, approximately 0.5 mile west along South Street from intersection of Interstate Route 95.
RM 3	62.64	MDOT bench mark, stamped 184, located at south end of Interstate Route 95 southbound over the Saco River.
RM 4	62.64	Railroad spike, set in utility pole No. 7 on south side of Main Street opposite entrance to Biddeford-Saco Rotary Park.

¹ National Geodetic Vertical Datum of 1929

KEY TO MAP	
500-Year Flood Boundary	-----
100-Year Flood Boundary	-----
Zone Designations*	
100-Year Flood Boundary	-----
500-Year Flood Boundary	-----
Base Flood Elevation Line With Elevation in Feet**	-----51.3
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7x
Zone D Boundary	-----
River Mile	•M1.5

*Referenced to the National Geographic Vertical Datum of 1929

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (Zones A and V) may be protected by flood control structures.

This map is for flood insurance and flood plain management purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas. The coastal flooding elevations shown may differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

For adjoining map panels, see separately printed Index To Map Panels.

Coastal base flood elevations shown on this map include the effects of wave action.

Coastal base flood elevations apply only landward of the shoreline shown on this map.

INITIAL IDENTIFICATION:
MAY 24, 1974
FLOOD HAZARD BOUNDARY MAP REVISIONS:
NOVEMBER 5, 1976

FLOOD INSURANCE RATE MAP EFFECTIVE:
MAY 15, 1984
FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.



APPROXIMATE SCALE
400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM FLOOD INSURANCE RATE MAP

CITY OF
BIDDEFORD,
MAINE
YORK COUNTY

PANEL 3 OF 11
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230145 0003 B

EFFECTIVE DATE:
MAY 15, 1984



Federal Emergency Management Agency

Exhibit 6

Stormwater Management

Exhibit 6 – Stormwater

The proposed development is limited to internal changes to the existing building, and therefore, not anticipated to affect the overall stormwater drainage of the property and existing drainage systems.

Exhibit 7

Landscaping

Exhibit 7 – Landscaping

The proposed development is limited to internal changes to the existing building. Existing on-site landscaping will remain unchanged.

Exhibit 8

Traffic

Exhibit 8 – Traffic

The proposed development is limited to internal changes to the existing building. The proposed development will utilize the existing site entrances from Alfred Road and Edwards Avenue as well as the existing on-site parking layout. The gym facility will have no effect on traffic trip demands from the previously approved facility. The change of use from the movie theater space to the proposed pickleball facility will create a large decrease in traffic impacts on the surrounding area. Please see the table below for trip calculations based on the 11th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.

ITE Trip Calculations for Existing Conditions v. Proposed Conditions

<i>Time Period</i>	<i>700 Seat/23 KSF Movie Theatre (LUC-445)</i>	<i>6 Court Racquet/Tennis Club (LUC-491)</i>	<i>Difference</i>
Weekday	1524	166	-1,358
PM Peak Hour – Adjacent St.	99	23	-76

Exhibit 9

Utilities

Exhibit 9 – Utilities

The proposed development will utilize existing utility service to the building. The proposed uses are not proposed to impact electric and gas demand. The proposed changes will result in a significant decrease on the demand on public water and sewer to the site. Please see attached a memorandum on wastewater demand changes for current projects on the site.



Memorandum

To: David Galbraith
From: Jordan Gagnon, Esq.
CC: Kylie Mason, R.L.A.
Date: April 29, 2024
RE: Wastewater Demand of Proposed Development – 420 Alfred Road

On behalf of our client, BVH Biddeford, LLC, we are pleased to submit the following information regarding changes in wastewater demand on public water and sewer service from proposed redevelopment projects in Five Points Shopping Center. The parcel identified as Lot 26-1 on the City of Biddeford Tax Map 20 and located at 420 Alfred Road, is home to four (4) current interior renovation or change of use redevelopment projects. All of the projects will utilize the site's existing connections with public water and sewer utilities. In order to understand the impact of the proposed redevelopments on the existing public water and sewer connections, we have analyzed the demand changes from the previously permitted uses for each in terms of gallons per day (gpd). The four proposed projects that have been included in this analysis are:

Orange Circuit Fitness: Redevelopment of Suite 220, approximately 10,000 sf that was previously home to Planet Fitness.

Pickleball Facility (unnamed): Redevelopment of Suite 190, approximately 23,000 sf that was previously home to Smitty's Cinema Biddeford.

JAR Cannabis Company: Redevelopment of Suite 151, approximately 2,500 sf that was previously home to ColorTyme.

Golden Apple Buffet: Redevelopment of Suite 135, approximately 11,000 sf that was previously home to Tin Tin Buffet.

The previously permitted wastewater demand of the area's prior uses and the wastewater demand of the proposed uses and layouts have been calculated in accordance with the rules of the State of Maine Subsurface Wastewater Disposal Rules published by the Maine Department of Health & Human Services Maine Center for Disease Control & Prevention circa 2014. The previously permitted demand, proposed demand, and difference in demand have been compiled for each project area in Table A below.

Table A – Wastewater Demand by Facility

Facility	Rule	Gpd 1	Metric 1	Gpd 2	Metric 2	Total gpd
Tennis or Racquetball (Pickleball Facility)	300 gpd per court	300 gpd	6 courts	-	-	1,800
*Theater (Smitty's Cinema)	5 gpd per seat & 12gpd per staff	5 gpd	700 seats	12 gpd	20 employees	3,740
Fitness and Exercise Center (Orange Circuit Fitness)	50 gpd per 100 sq. ft.	50 gpd	100	-	-	5,000
*Fitness and Exercise Center (Planet Fitness)	50 gpd per 100 sq. ft.	50 gpd	100	-	-	5,000
Restaurant (Golden Apple Buffet)	21 gpd per seat & 12 gpd per staff	20 gpd	282	12 gpd	16 employees	5,832
*Restaurant (Tin Tin Buffet)	20 gpd per seat & 12 gpd per staff	20 gpd	280	12 gpd	18 employees	5,816
Employees at place of employment w/ no showers (JAR Cannabis)	12 gpd per staff	12 gpd	4 employees	-	-	48
*Employees at place of employment w/ no showers (ColorTyme)	12 gpd per staff	12 gpd	4 employees	-	-	48

* Previously permitted or existing use

The proposed redevelopment projects will result in a decrease in wastewater demand on the public system compared to the previously permitted uses. The four projects will result in a total decrease of 1,924 gpd. The impact calculations account for peak demand when the aforementioned project sites were previously occupied as some of the areas are currently vacant. The existing, proposed, and increase/decrease in gpd for each proposed project has been organized in Table B below.

Table B – Wastewater Demand Existing v. Proposed

Development	Existing	Proposed	Gpd demand increase/ decrease
Pickleball Facility (unnamed)	3,740	1,800	-1,940
Orange Circuit Fitness	5,000	5,000	0
Golden Apple Buffet	5,816	5,832	16
JAR Cannabis	48	48	0
Total	14,604	12,680	-1,924

Based on the preceding information, the four proposed redevelopment projects in the Five Points Shopping Center will not create additional burden on the municipal utilities serving the site. In this regard, we look forward to discussing the proposed projects further. Please let me know if you have any questions, concerns, or require any additional information. I can be contacted through my direct line at 207-200-2115 or via e-mail at jgagnon@sebagotechnics.com.

Sincerely,

SEBAGO TECHNICS, INC.



Jordan Gagnon, Esq.
Permitting Specialist/Project Coordinator

cc: Kylie Mason, R.L.A.

Exhibit 10

Standards

Exhibit 10 – Standards

The proposed development is limited to internal changes to the existing building. No changes are proposed to the site design and will remain in accordance with the Site Design Criteria and all other applicable sections of the City of Biddeford Ordinance, Part III Land Development Regulations.

Exhibit 11

Site Photographs

Site Photographs
Five Points Shopping Center – Pickleball Facility
March 2024

#1 *Proposed Gym Facility Location*

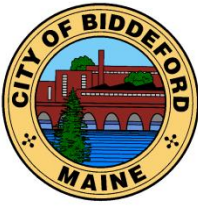


#2 *Proposed Pickleball Facility Location*



#3 *Proposed Pickleball location in relation to existing complex*





CITY OF BIDDEFORD

Planning and Development Department

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Conditional Use Permit

Pickle Ball Fitness Facility

420 Alfred Street, Biddeford, ME

Case # 2024.24 – May 15, 2024

Pursuant to the provisions of the City of Biddeford Land Development Regulations, Article VI (Performance Standards), Section 18 – Commercial Recreation Activities, the Biddeford Planning Board has considered the application of BVH Biddeford LLC who is seeking a Preliminary Site Plan/Conditional Use Review for the proposed change of use and the creation of a pickle ball recreation center, within the former Smitty's Cinema tenant space, located within the Five Points Shopping Center located at 420 Alfred Road (Tax Map 20, Lot 26-1). The Board has reviewed the submitted application materials, 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:

1. Project Data:

1.	Applicant:	BHV Biddeford, LLC 2 Livewell Drive Kennebunk, ME 04043
2.	Owner of Property:	Same as Applicant
3.	Agent:	Kyle Mason Sebago Technics 75 John Roberts Road, Suite \$a South Portland, ME 04106
4.	Surveyor:	N/A
5.	Project Location:	420 Alfred Street
6.	Project Tax Map #/Lot #:	Tax Map 20, Lot 26-1
7.	Lot Size:	24 Acres
8.	Base Zoning:	I3
9.	Overlay Zoning:	N/A
10.	Existing Use:	
11.	Proposed Use:	Create Pickle Ball Recreation Center
12.	Approvals Required:	
13.	Uses in the Vicinity:	Commercial
14.	Waivers Needed:	a. None
18.	Waivers Granted:	a. None
22.	Other Non-City Permits Required:	
23.	LDR Attachment A: Fees Paid:	All Paid
25.	Planning Board Review History: Preliminary Site Plan/Conditional Use Review 3-20-24	

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Conditional Use Permit
Pickle Ball Fitness Facility
420 Alfred Street, Biddeford, ME
Case # 2024.24 – May 15, 2024

2. **Performance Standards:** The Board made the following conclusions in their review standards of Article VI (Performance Standards), Section 18 (Commercial Recreation) states as follows:

1. The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws;

The proposed use will comply with all State and local Codes and Ordinances.

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;

The site is an existing developed site was previously reviewed and approved by the Planning Board.

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;

The applicant does not intend to install any additional exterior lighting and the location is in a discreet location with no known existing lighting issues.

4. The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;

There is no development proposed by this project and the site is located in a business/industrial area and the proposed use will be located within an existing, approved shopping center.

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;

The proposed use as a pickle ball facility is not expected to generate any noise, vibrations, fumes, odor, dust, glare, hours of operation, or other causes that will have any detrimental effect on surrounding uses.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Conditional Use Permit
Pickle Ball Fitness Facility
420 Alfred Street, Biddeford, ME
Case # 2024.24 – May 15, 2024

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;

The site and proposed tenant space have two points of vehicle access on to Alfred Road, which has adequate capacity to serve the proposed use.

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;

The proposed use will have the same parking and traffic demand as was previously operating from this location without incident.

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;

Adjacent parcels are industrial/commercial. The operation should not change in any way that may impact this standard negatively given the recommended Conditions of Approval and existing Performance Standards.

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;

The proposed use is proposed to be located within an existing shopping center and will not impact the privacy of the immediate area.

10. The proposed use would be in compliance with Biddeford's Comprehensive Plan;

Although the Comprehensive Plan does not specifically address pickle ball facilities, this type of use is permitted in the I-3 zone as per the Future Land Use Plan of the 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;

There are no modifications to the Site or the building's exterior proposed.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

**Conditional Use Permit
Pickle Ball Fitness Facility
420 Alfred Street, Biddeford, ME
Case # 2024.24 – May 15, 2024**

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;

The property is not located in a flood zone.

13. Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;

The tenant space will be served by Maine Water. As previously mentioned, the shopping center is connected to one of the City's sewer lines that is close to capacity. The proposed use is the same type of use as the previous tenant and as such the applicant's proposal can be accommodated.

14. Adequate provision has been made to control erosion or sedimentation;

N/A. This proposal is for an interior remodel so erosion control measures are not required.

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;

There are no site improvements/disturbances proposed that would affect existing stormwater system.

16. The proposed water supply would meet the demands of the proposed use for fire protection purposes;

Maine Water Company serves this site and has provided an Ability to Serve letter.

17. Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;

The applicant has indicated there will not be a presence of hazardous substances, and if there were, State Law must be adhered.

18. The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification of the proposal;

N/A The proposed use is to be located in the middle tenant space of the existing Five Points Shopping Center. No site alterations are proposed for the site.

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.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

**Conditional Use Permit
Pickle Ball Fitness Facility
420 Alfred Street, Biddeford, ME
Case # 2024.24 – May 15, 2024**

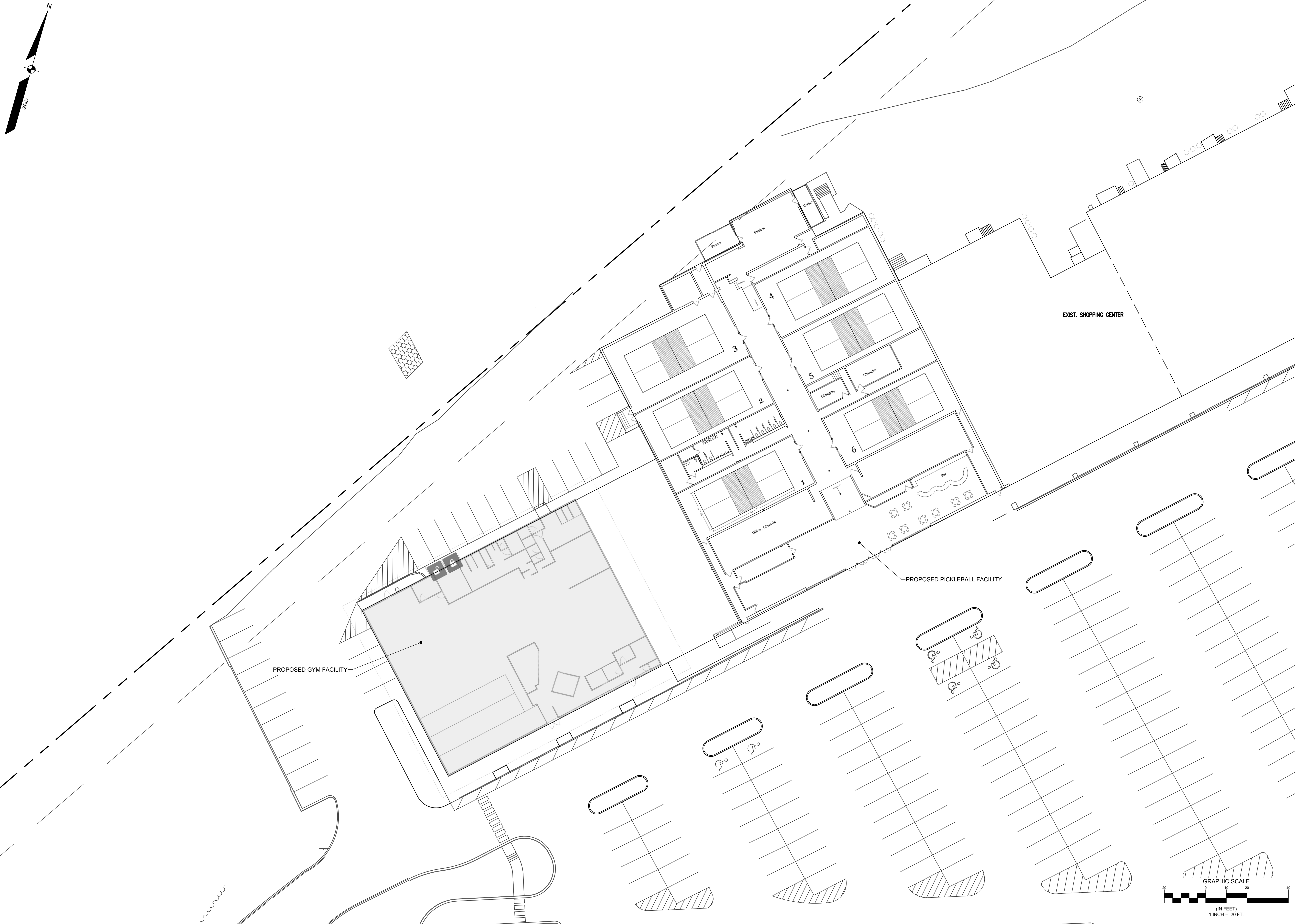
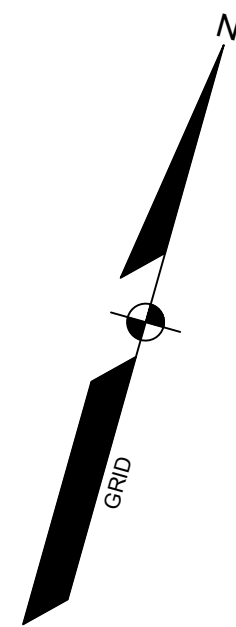
The parcel is not located in a Shoreland Zone.

APPROVAL GRANTED: Based on the evidence available and the conclusions above, the Biddeford Planning Board approves the Conditional Use Permit for the proposed project summarized above, located at 420 Alfred Street in accordance with the submitted application, supporting data, representations made, other related materials on file, and the following Conditions of Approval:

1. Standard Conditions of Approval apply.
2. The applicant shall obtain all other pertinent local, state and federal permits/licenses/insurance such as building, electrical, plumbing, etc., prior to commencing business.
3. A bike rack shall be provided for the proposed use per City Ordinance.
4. All conditions previously approved by the Planning Board for uses located within the Five Points Shopping Center are hereby reaffirmed.

Mr. Larry Patoine, Planning Board Chair

Date:



05142 S.dwg, TAB:Site

SEBAGO
TECHNICS
WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd.
Suite 4A
South Portland, ME 04106
Tel. 207-200-2100

SITE PLAN
OF:
FIVE POINTS SHOPPING CENTER
420 ALFRED ROAD
BIDDEFORD, ME
FOR:
ATLANTIC HOSPITALITY
2 LIVEWELL DRIVE
KENNEBUNK, ME 04043

DESIGNED	DES
DRAWN	DRW
CHECKED	CHK
DATE	02/15/2024
SCALE	1" = 20'
PROJECT	05142

5142 S
SHEET 2 OF 2

PLS OR PE

NOT FOR
CONSTRUCTION

REV	BY	DATE	STATUS
REV	BY	DATE	STATUS

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBACO TECHNICS, INC. ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBACO TECHNICS, INC.

PLS OR PE

PROGRESS
PRINT



Memorandum

To: David Galbraith
From: Jordan Gagnon, Esq.
CC: Kylie Mason, R.L.A.
Date: April 29, 2024
RE: Wastewater Demand of Proposed Development – 420 Alfred Road

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Table A – Wastewater Demand by Facility

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* Previously permitted or existing use

The proposed redevelopment projects will result in a decrease in wastewater demand on the public system compared to the previously permitted uses. The four projects will result in a total decrease of 1,924 gpd. The impact calculations account for peak demand when the aforementioned project sites were previously occupied as some of the areas are currently vacant. The existing, proposed, and increase/decrease in gpd for each proposed project has been organized in Table B below.

Table B – Wastewater Demand Existing v. Proposed

Development	Existing	Proposed	Gpd demand increase/ decrease
Pickleball Facility (unnamed)	3,740	1,800	-1,940
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Based on the preceding information, the four proposed redevelopment projects in the Five Points Shopping Center will not create additional burden on the municipal utilities serving the site. In this regard, we look forward to discussing the proposed projects further. Please let me know if you have any questions, concerns, or require any additional information. I can be contacted through my direct line at 207-200-2115 or via e-mail at jgagnon@sebagotechnics.com.

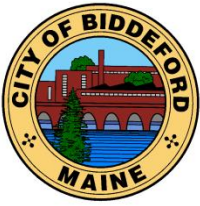
Sincerely,

SEBAGO TECHNICS, INC.



Jordan Gagnon, Esq.
Permitting Specialist/Project Coordinator

cc: Kylie Mason, R.L.A.



CITY OF BIDDEFORD

Planning and Development Department

David CM Galbraith
City Planner/Deputy Director
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115
david.galbraith@biddefordmaine.or

PLANNING BOARD REPORT

TO: Larry Patoine, Chair & the Biddeford Planning Board

FROM: David CM Galbraith, City Planner / Deputy Director of Planning

DATE: May 6, 2024

RE: **2024.20 Conditional Use Permit for an Adult-Use Retail Marijuana Facility for JAR Co. CV LLC at 420 Alfred Street, Unit 11, 5 Points Shopping Center (Tax Map 20, Lot 26-1) in the I-3 Zone.**

MEETING DATE: May 15, 2024 @ 6:00 PM

1. INTRODUCTION



The Applicant, JAR Co. CV LLC, is seeking Planning Board approval for an adult use marijuana retail sales facility at 420 Alfred Street, Unit 11 (Property ID # Map 20, Lot 26-1). The subject property is 5 Points Shopping Center, is zoned I-3. JAR is new to Biddeford, but they have been operating in the Adult Use market since the beginning of the State's adult use program. The applicant currently has 5 adult use cannabis stores operating in the State of Maine and has 100% perfect compliance record with the Office of Cannabis Policy and the towns they operate in.

JAR Cannabis – Five Points Shopping Center – Tenant Location

2024.20 Conditional Use Permit for a Adult-Use Retail Marijuana Facility for JAR Co. CV LLC at 420 Alfred Street, Unit 11 (Tax Map 20, Lot 26-1) in the I-3 Zone.
Planning Board Hearing Date: May 15, 2024

Adult-Use Retail Marijuana Facilities are a Conditional Use in the Industrial-1 (I-3) Zone. As the Board is aware, at the December 19, 2023 meeting the City Council adopted new regulations that allow adult-use recreational marijuana retail stores within the City's I-1, I-3 & I-3 zoning districts as a "conditional use". The retail facility will be located within the existing 5 Points Shopping Center. Staff believes the existing site parking is adequate to support the proposed retail use. The City's Land Use Ordinance defines adult use marijuana stores as:

MARIJUANA STORE, ADULT USE:

A facility licensed by the State of Maine to purchase adult use marijuana, immature marijuana plants and seedlings from a cultivation facility, to purchase adult use marijuana and adult use marijuana products from a products manufacturing facility, to collect and transport samples of marijuana, marijuana concentrate and marijuana products in a marijuana store's possession for mandatory testing, and to sell adult use marijuana, adult use marijuana products, immature marijuana plants and seedlings to consumers.

[Added 1-19-2021 by Ord. No. 2021.1]

Staff does not foresee any issues with this operation at this established location.

2. PROJECT DATA

	<i>SUBJECT</i>	<i>DATA/INFORMATION</i>
1.	Applicant:	JAR Co. CV LLC 75 Westminster Street Lewiston, ME 04240
2.	Owner of Property:	BVH Biddeford, LLC 2 Livewell Drive, Suite 201 Kennebunk, ME 04043
3.	Surveyor/Engineer:	Travis Nadeau Platz Associates 2 Great Falls Plaza #7A Auburn, ME 04210
4.	Project Location:	420 Alfred Street, Unit 11
5.	Project Tax Map #/Lot #:	20/26-1
6.	Existing Zoning:	I-3 – Adult-Use Retail Marijuana Facility is a Conditional Use
7.	Overlay Zoning:	None
8.	Existing Use:	
9.	Proposed Use:	Establishment of a new Adult-Use Retail Marijuana Facility
10.	Approvals Required:	Conditional Use
11.	Uses in the Vicinity:	Commercial/Industrial
12.	Number of Lots/Units in Subdivision:	N/A
13.	Minimum Lot Size Required: Provided:	None 1.6 acres
14.	Frontage Required: Provided:	50' 305' +/-

2024.20 Conditional Use Permit for a Adult-Use Retail Marijuana Facility for JAR Co. CV LLC at 420 Alfred Street, Unit 11 (Tax Map 20, Lot 26-1) in the I-3 Zone.
Planning Board Hearing Date: May 15, 2024

15.	Front Setback Required: Provided:	40' >40'
16.	Side Setbacks Required: Provided:	25' >25'
17.	Rear Setback Requires: Provided:	25' >25'
18.	Height Requirements: Provided:	60 feet or 6 stories. < 60 feet
19.	Water Supply:	Maine Water Company
20.	Sewerage Disposal:	City of Biddeford
21.	Solid Waste Disposal:	Private Hauler
22.	Fire Protection:	City of Biddeford
23.	Floodplain Status:	Property is not within a NFIP Zone A or V flood zone
24.	Wetland/Surface Water Impacts:	None
25.	Soil Study Provided:	N/A
26.	Parking Spaces Required:	
27.	Parking Spaces Provided (total): # Handicapped Spaces:	
28.	Ownership of Road:	Alfred Street is a Public Road
29.	Impervious Surface Area:	0 SF Change
30.	Total Disturbed Area:	0 SF of previously undisturbed area.
31.	Estimated Site Development Costs:	N/A
35.	Financial Capacity Letter:	N/A – Internal Construction Only
36.	Waivers Requested/Needed:	a. Article XI, Full Site Plan Review as per Article XI, Section 9.B.2.
37.	Waivers Granted:	
38.	Variances Needed for Approval:	None.
39.	Other Permits Obtained:	Conditional Adult Use Cannabis Permit
40.	Other Non-City Permits Required:	None.
41.	Covenants, By-laws, Restrictions Required:	None
42.	LDR Attachment A: Fees Paid:	Yes
42.		
43.	Planning Board Review History: Conditional Use Permit	May 15, 2024

3. EXISTING CONDITIONS

The site is a fully developed partially vacant shopping center and associated parking.

4. PROJECT PROPOSAL

Adult-Use Retail Marijuana Facility.

5. OUTSTANDING ISSUES TO BE ADDRESSED PRIOR TO APPROVAL:

2024.20 Conditional Use Permit for a Adult-Use Retail Marijuana Facility for JAR Co. CV LLC at 420 Alfred Street, Unit 11 (Tax Map 20, Lot 26-1) in the I-3 Zone.
Planning Board Hearing Date: May 15, 2024

6. STAFF REVIEW

- a. **ZONING:** Adult-Use Retail Marijuana Facility, is a Conditional Use in the I-3 Zone. There is no minimum lot size.
- b. **SEWER CAPACITY:** One of the issues raised during the review of this application and the other pending applications for the Five Points Shopping Center is the capacity of the sewer line that transfers the sewer from the subject property into the City's sewer line that runs behind the shopping center. The City continues to review sewer capacity in this line, however, providing the sewer demands are the same or less than the prior tenant usage it has been determined that the sewer can accommodate the proposed use. Below is a sewer capacity comparison of the proposed JAR Cannabis

Employees at place of employment w/ no showers <i>(JAR Cannabis)</i>	12 gpd per staff	12 gpd	4 employees	-	-	48
*Employees at place of employment w/ no showers <i>(ColorTyme)</i>	12 gpd per staff	12 gpd	4 employees	-	-	48
* Previously permitted or existing use						

- c. **WAIVERS REQUESTED / REQUIRED:** Article XI, Full Site Plan Review.

Staff Recommendation: Given there are no building expansions proposed and not increase in impervious surface proposed Staff recommend the Board grant this waiver which says that sufficient information has been provided to consider this application for review.

d. **REVIEW STANDARDS:**

Article VI (Performance Standards), Section 77 (Marijuana Establishments) states as follows:

Section 77
 Marijuana Establishments
 [Added 1-17-2017 by Ord. No. 2016.88]

- a. **CONDITIONAL USE STANDARDS:** The following are the standards for review under a Conditional Use Permit (standards in *italic*, Staff Comments in regular font):
- i. The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws;*

The proposed use will comply with all State and local Codes and Ordinances

- ii. *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;*

The site is an existing developed site was previously reviewed and approved by the Planning Board. The Fire Department will also be involved in the Code Enforcement Department's consideration of building and occupancy permits.

JAR's space will be remodeled in compliance with local, state and federal building codes. Our unit and building has a sprinkler system. All modifications to the sprinkler system will be review by the State Fire Marshall and inspected once complete by Biddeford Code Enforcement and Biddeford Fire Department.

- iii. *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;*

The applicant does not intend to install any additional exterior lighting and the location is in a discreet location with no known existing lighting issues. There is existing exterior via poles in the driveway, we will add additional commercial grade wall pack LED's controlled by a photocell that will be hard wired to our electrical panel.

- iv. *The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;*

There is no development proposed by this project and the site is located in a business/industrial area.

We do not propose any changes, on site landscaping already exists on the property.

- v. *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;*

All activities are proposed within the existing building. City Ordinance includes odor control standards which must be complied with. The application is for a retail adult use marijuana store which sells prepackaged products. Past experience with uses of this nature do not tend to get odor complaints but the applicants have provided an odor control plan for adequate odor control reinforcing the performance standards in the Ordinance.

2024.20 Conditional Use Permit for a Adult-Use Retail Marijuana Facility for JAR Co. CV LLC at 420 Alfred Street, Unit 11 (Tax Map 20, Lot 26-1) in the I-3 Zone.
Planning Board Hearing Date: May 15, 2024

Our odor mitigation plan is included in our planning board application. Hours of operation will be 8am-9pm Monday-Sunday. Hours are consistent with other approved retail businesses in the I-3 zone.

- vi. *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;*

Our property is accessed via two traffic lights from Alfred St. The larger complex at Play 5 is mostly vacant. There is adequate ingress/egress infrastructure onto the property to ensure our use will not impact traffic on adjacent public streets.

- vii. *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;*

Staff anticipates no issues with hazards to public safety or traffic congestion in this area. The building site was previously used for medical marijuana retail sales and the proposed use is anticipated to generate the same amount of traffic.

- viii. *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;*

Adjacent parcels are industrial/commercial. The operation should not change in any way that may impact this standard negatively given the recommended Conditions of Approval and existing Performance Standards.

Our lease and operation of the space is an important component to our landlord developing and remodeling the rest of the Play 5 complex. Our landlord already has plans to improve the property which will increase the value of this property and adjacent properties.

- ix. *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;*

Our use will not impact the privacy of residents in the immediate area. There are no residential properties within 500 feet of our unit at 420 Alfred St.

- x. *The proposed use would be in compliance with Biddeford's Comprehensive Plan;*

Although the Comprehensive Plan does not specifically address adult use marijuana retail sales, this type of use is permitted in the I-3 zone as per the Future Land Use Plan of the Comprehensive Plan.

2024.20 Conditional Use Permit for a Adult-Use Retail Marijuana Facility for JAR Co. CV LLC at 420 Alfred Street, Unit 11 (Tax Map 20, Lot 26-1) in the I-3 Zone.
Planning Board Hearing Date: May 15, 2024

- xi.* *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;*

There are no modifications to the Site or the building's exterior proposed.

We plan to remodel the inside of our unit, which will be minor renovations. Our landlord already has plans to improve the greater property at 420 Alfred St. JAR's remodel will not change the building size, height, or historical character. JAR's renovations will confirm with local, State and Federal codes.

- xii.* *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;*

The property is not located in a flood zone.

We do not propose any changes to the exterior of our building that would have impact on flood hazards.

- xiii.* *Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;*

Maine Water Company serves this site and has provided an Ability to Serve letter.

Our property is served by public water and sewer. Our unit will use that existing infrastructure in accord with local codes. There will be no changes specific to our use that would impact ground of surface water contamination.

- xiv.* *Adequate provision has been made to control erosion or sedimentation;*

Not applicable. The unit we will operate is existing. JAR will be remodeling the interior of the unit.

- xv.* *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;*

There are no site improvements/disturbances proposed that would affect existing stormwater system.

Not applicable. The unit and property we will operate is existing. JAR will be remodeling the interior of the unit. There will be no impact to stormwater runoff.

- xvi.* *The proposed water supply would meet the demands of the proposed use for fire protection purposes;*

2024.20 Conditional Use Permit for a Adult-Use Retail Marijuana Facility for JAR Co. CV LLC at 420 Alfred Street, Unit 11 (Tax Map 20, Lot 26-1) in the I-3 Zone.
Planning Board Hearing Date: May 15, 2024

Maine Water Company serves this site and has provided an Ability to Serve letter.

- xvii. *Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;*

The applicant has not indicated there will be a presence of hazardous substances, and if there were, State Law must be adhered.

There will be no hazardous substances on site. JAR's internal procedure for handling marijuana waste is included in this application, in compliance with State regulations.

- xviii. *The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification of the proposal;*

The proposed use is to be located in the middle tenant space of the existing Five Points Shopping Center. No site alterations are proposed for the site.
N/A

- xix. *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.*

The parcel is not located in a Shoreland Zone.

7. NEXT STEPS/SUGGESTED ACTIONS

Recommend the Planning Board grant the waiver request for a full site plan review submittal given no site alterations are proposed.

Recommend that if the Planning Board approves the Conditional Use Permit it be approved with the following minimum conditions of approval:

1. Standard Conditions of Approval apply.
2. The applicant shall obtain all other pertinent local, state and federal permits/licenses/insurance such as building, electrical, plumbing, etc., prior to commencing business.
3. No cannabis odors may be detectable from any place outside the structure(s) in which the use occurs. The Odor Abatement Plan must be implemented prior to the issuance of an occupancy permit.

8. SAMPLE MOTIONS:

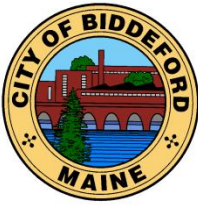
- I. Motion to waive Article XI, Full Site Plan Review. *I motion to waive Article XI, full site plan review, as no site improvements are being made.*

2024.20 Conditional Use Permit for a Adult-Use Retail Marijuana Facility for JAR Co. CV LLC at 420 Alfred Street, Unit 11 (Tax Map 20, Lot 26-1) in the I-3 Zone.
Planning Board Hearing Date: May 15, 2024

- II. Motion to approve the Conditional Use Permit and the Findings of Fact and Conclusions of Law for JAR Co. CV LLC for an adult-use recreational marijuana retail facility at 420 Alfred Street, Unit 11(Tax Map 20, Lot 26-1).
- III. Motion to Table the Conditional Use Permit and the Findings of Fact and Conclusions of Law for JAR Co. CV LLC for an adult-use recreational marijuana retail facility at 420 Alfred Street, Unit 11(Tax Map 20, Lot 26-1), based upon the following reasons:
- a) _____
- b) _____
- c) _____
- IV. Motion to deny the Conditional Use Permit and the Findings of Fact and Conclusions of Law for JAR Co. CV LLC for an adult-use recreational marijuana retail facility at 420 Alfred Street, Unit 11(Tax Map 20, Lot 26-1), based upon the following reasons:
- a) _____
- b) _____
- c) _____

ATTACHMENTS

1. Conditional Use Permit Application Package
2. Draft Findings of Fact and Conclusions of Law



CITY OF BIDDEFORD

Planning and Development Department

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Conditional Use Permit

Adult-use Retail Marijuana Store

JAR Co. CV LLC 420 Alfred Street, Biddeford, ME

Case # 2024.20 – May 15, 2024

Pursuant to the provisions of the City of Biddeford Land Development Regulations, Article VI (Performance Standards), Section 77 – Marijuana Establishments, the Biddeford Planning Board has considered the application of JAR Co. CV LLC to convert an existing retail shop into an “adult use marijuana retail store”, 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:

1. Project Data:

	<i>SUBJECT</i>	<i>DATA/INFORMATION</i>
1.	Applicant:	JAR Co. CV LLC 75 Westminster Street Lewiston, ME 04240
2.	Owner of Property:	BVH Biddeford, LLC 2 Livewell Dr. Suite 201 Kennebunk, ME 04043
3.	Surveyor/Engineer:	N/A
4.	Project Location:	420 Alfred Street
5.	Project Tax Map #/Lot #:	20/26-1
6.	Existing Zoning:	I-3 Adult-Use Retail Marijuana Facility is a Conditional Use in I-3
7.	Overlay Zoning:	None
8.	Existing Use:	Retail Shop
9.	Proposed Use:	Establishment of a new Adult-Use Retail Marijuana Facility
10.	Approvals Required:	Conditional Use
11.	Uses in the Vicinity:	Commercial/Industrial/Residential
12.	Number of Lots/Units in Subdivision:	N/A
13.	Minimum Lot Size Required: Provided:	None 1.22 acres
14.	Frontage Required: Provided:	50' 190' +/-
15.	Front Setback Required: Provided:	40' >40'
16.	Side Setbacks Required: Provided:	25' >25'
17.	Rear Setback Requires: Provided:	25' >25'
18.	Height Requirements: Provided:	60 feet or 6 stories. < 60 feet
19.	Water Supply:	Maine Water Company

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Conditional Use Permit
Adult-use Retail Marijuana Store
JAR Co. CV LLC 420 Alfred Street, Biddeford, ME
Case # 2024.20

20.	Sewerage Disposal:	City of Biddeford
21.	Solid Waste Disposal:	Private Hauler
22.	Fire Protection:	City of Biddeford
23.	Floodplain Status:	Property is not within a NFIP Zone A or V flood zone
24.	Wetland/Surface Water Impacts:	None
25.	Soil Study Provided:	N/A
26.	Parking Spaces Required:	
27.	Parking Spaces Provided (total): # Handicapped Spaces:	
28.	Ownership of Road:	Alfred Street is a Public Road
29.	Impervious Surface Area:	0 SF Change
30.	Total Disturbed Area:	0 SF of previously undisturbed area.
31.	Estimated Site Development Costs:	N/A
35.	Financial Capacity Letter:	N/A – Internal Construction Only
36.	Waivers Requested/Needed:	a. Article XI, Full Site Plan Review as per Article XI, Section 9.B.2.
37.	Waivers Granted:	
38.	Variances Needed for Approval:	None.
39.	Other Permits Obtained:	N/A
40.	Other Non-City Permits Required:	None.
41.	Covenants, By-laws, Restrictions Required:	None
42.	LDR Attachment A: Fees Paid:	Yes
42.		
43.	Planning Board Review History: Conditional Use Permit	May 15, 2024

2. **Performance Standards:** The Board made the following conclusions in their review standards of Article VI (Performance Standards), Section 77 (Marijuana Establishments) states as follows:

- a. **CONDITIONAL USE STANDARDS:** The following are the standards for review under a Conditional Use Permit (standards in *italic*, Staff Comments in regular font):

- i. *The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws;*

The proposed use will comply with all State and local Codes and Ordinances

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Conditional Use Permit
Adult-use Retail Marijuana Store
JAR Co. CV LLC 420 Alfred Street, Biddeford, ME
Case # 2024.20

- ii. 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;*

The site is an existing developed site was previously reviewed and approved by the Planning Board. The Fire Department will also be involved in the Code Enforcement Department's consideration of building and occupancy permits.

JAR's space will be remodeled in compliance with local, state and federal building codes. Our unit and building has a sprinkler system. All modifications to the sprinkler system will be review by the State Fire Marshall and inspected once complete by Biddeford Code Enforcement and Biddeford Fire Department.

- iii. 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;*

The applicant does not intend to install any additional exterior lighting and the location is in a discreet location with no known existing lighting issues.

There is existing exterior via poles in the driveway, we will add additional commercial grade wall pack LED's controlled by a photocell that will be hard wired to our electrical panel.

- iv. The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;*

There is no development proposed by this project and the site is located in a business/industrial area.

We do not propose any changes, on site landscaping already exists on the property.

- v. 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;*

All activities are proposed within the existing building. City Ordinance includes odor control standards which must be complied with. The application is for a retail adult use marijuana store which sells prepackaged products. Past experience with uses of this nature do not tend to get odor complaints but the applicants have provided an odor control plan for adequate odor control reinforcing the performance standards in the Ordinance.

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Conditional Use Permit
Adult-use Retail Marijuana Store
JAR Co. CV LLC 420 Alfred Street, Biddeford, ME
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Our odor mitigation plan is included in our planning board application. Hours of operation will be 8am-9pm Monday-Sunday. Hours are consistent with other approved retail businesses in the I-3 zone.

- vi. *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;*

Our property is accessed via two traffic lights from Alfred St. The larger complex at Play 5 is mostly vacant. There is adequate ingress/egress infrastructure onto the property to ensure our use will not impact traffic on adjacent public streets.

- vii. *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;*

Staff anticipates no issues with hazards to public safety or traffic congestion in this area. The building site was previously used for medical marijuana retail sales and the proposed use is anticipated to generate the same amount of traffic.

- viii. *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;*

Adjacent parcels are industrial/commercial. The operation should not change in any way that may impact this standard negatively given the recommended Conditions of Approval and existing Performance Standards.

Our lease and operation of the space is an important component to our landlord developing and remodeling the rest of the Play 5 complex. Our landlord already has plans to improve the property which will increase the value of this property and adjacent properties.

- ix. *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;*

Our use will not impact the privacy of residents in the immediate area. There are no residential properties within 500 feet of our unit at 420 Alfred St.

- x. *The proposed use would be in compliance with Biddeford's Comprehensive Plan;*

Although the Comprehensive Plan does not specifically address adult use marijuana retail sales, this type of use is permitted in the I-3 zone as per the Future Land Use Plan of the Comprehensive Plan.

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Conditional Use Permit
Adult-use Retail Marijuana Store
JAR Co. CV LLC 420 Alfred Street, Biddeford, ME
Case # 2024.20

- xii.* *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;*

There are no modifications to the Site or the building's exterior proposed.

We plan to remodel the inside of our unit, which will be minor renovations. Our landlord already has plans to improve the greater property at 420 Alfred St. JAR's remodel will not change the building size, height, or historical character. JAR's renovations will confirm with local, State and Federal codes.

- xiii.* *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;*

The property is not located in a flood zone.

We do not propose any changes to the exterior of our building that would have impact on flood hazards.

- xiv.* *Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;*

Maine Water Company serves this site and has provided an Ability to Serve letter.

Our property is served by public water and sewer. Our unit will use that existing infrastructure in accord with local codes. There will be no changes specific to our use that would impact ground of surface water contamination.

- xv.* *Adequate provision has been made to control erosion or sedimentation;*

Not applicable. The unit we will operate is existing. JAR will be remodeling the interior of the unit.

- xvi.* *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;*

There are no site improvements/disturbances proposed that would affect existing stormwater system.

Not applicable. The unit and property we will operate is existing. JAR will be remodeling the interior of the unit. There will be no impact to stormwater runoff.

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Conditional Use Permit
Adult-use Retail Marijuana Store
JAR Co. CV LLC 420 Alfred Street, Biddeford, ME
Case # 2024.20

xvi. *The proposed water supply would meet the demands of the proposed use for fire protection purposes;*

Maine Water Company serves this site and has provided an Ability to Serve letter.

xvii. *Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;*

The applicant has not indicated there will be a presence of hazardous substances, and if there were, State Law must be adhered.

There will be no hazardous substances on site. JAR's internal procedure for handling marijuana waste is included in this application, in compliance with State regulations.

xviii. *The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification of the proposal;*

The proposed use is to be located in the middle tenant space of the existing Five Points Shopping Center. No site alterations are proposed for the site.
N/A

xix. *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.*

The parcel is not located in a Shoreland Zone.

APPROVAL GRANTED: Based on the evidence available and the conclusions above, the Biddeford Planning Board approves the Conditional Use Permit for the proposed project summarized above, located at 420 Alfred Street in accordance with the submitted application, supporting data, representations made, other related materials on file, and the following Conditions of Approval:

1. Standard Conditions of Approval apply.
2. All conditions previously approved for the Five Points Shopping Center by the Planning Board are hereby reaffirmed.
3. The applicant shall obtain all other pertinent local, state and federal permits/licenses/insurance such as building, electrical, plumbing, etc., prior to commencing business.

Mr. Larry Patoine, Planning Board Chair

Date:



Planning Board Application Cover Letter

JAR Cannabis Co.
Adult Use Marijuana Retail Store
420 Alfred St Unit 11 Biddeford, ME
March 1st, 2024

Hello Biddeford Planning Board,

My name is Joel Pepin. I am the co-founder and co-owner of JAR Cannabis company. Enclosed, please find our application for an Adult Use Marijuana Retail Store on behalf of JAR Co. CV LLC.

JAR is a vertically integrated cannabis company that has been operating in the Adult Use market since the beginning of the adult use cannabis program. We currently have five adult use cannabis stores operating in the State of Maine. JAR has 100% perfect compliance record with the Office of Cannabis Policy, and with all towns & cities we operate in. We are excited to bring our business to Biddeford.

Thank you in advance for your review and consideration.

Joel Pepin



City of Biddeford – Planning Department

Planning Board Application

P.O. Box 586, 205 Main Street Biddeford, Maine 04005

207-284-9115

Type of Application:

☐ Shoreland Zoning Permit ☐ Site Plan Review ☐ Extraction
☒ Conditional Use Permit ☐ Subdivision ☐ Private Way
☐ Other: _____

Applicant Information:

Name: JAR Co. CV LLC
 Mailing Address: 75 Westminster St Lewiston, ME 04240
 Telephone: 207-333-8171
 Email: joel@jarcannabis.com
 What is your legal interest in the property?
☐ Owner ☐ Potential Buyer with Contract ☒ Lease/Rental Agreement

Owner's Information:

Name: BVH Biddeford, LLC
 Mailing Address: 2 Livewell Dr Suite 201 Kennebunk, ME 04043
 Telephone: 207-967-1514
 Email: valerie@atlanticholdings.net

Agent's Information:

Name: United Corporate Services, Inc
 Mailing Address: 100 Second Avenue Augusta, ME 04330
 Telephone: 914-949-9188
 Email: Amy.Osgood@unitedcorporate.com

Engineer/Surveyor's Information:

Name: Travis Nadeau - Platz Associates
 Mailing Address: 2 Great Falls Plaza # 7A, Auburn, ME 04210
 Telephone: (207) 784-2941
 Email: TNadeau@platzassociates.com

Project Location and Lot Information:

Street Address: 420 Alfred St Unit 11 Drainage Watershed: N/A
Tax Map: Map 20 Lot: Lot 26-1
Current Zoning: I-3 - industrial 3 Shoreland Zoning: N/A
 Size of Lot: _____ () acres () s.f. Lot Frontage: _____
 Existing Use of Property: Shopping Mall - Retail

Property currently serviced by:

☐ City Road ☐ Public Sewer ☐ Public Water ☐ Public Trash
☐ Private Road ☐ Septic System ☐ Private Well ☐ 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

Is the project within the 100-year floodplain? ☐ (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:

Adult Use Cannabis Retail Store

Property to be Serviced by:

☒ City Road ☒ Public Sewer ☒ Public Water ☐ Public Trash
☐ Private Road ☐ Septic System ☐ Private Well ☒ Private Hauler

Limits of Disturbance: None () acres () s.f.

Net change in impervious cover: None () acres () s.f.

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

Is the project proposing a new Private or Public Road? ☐ (Yes, Private) ☐ (Yes, Public) ☒ (No)

Is this project within the Urbanized Area/MS4 (see [City Drainage Map](#)) ☐ (Yes) ☒ (No)

Is the project proposing any Stormwater facilities/BMPs? ☐ (Yes) ☒ (No)

Will a Traffic Movement Permit (TMP) be required?: ☐ (Yes) ☒ (No)

If in a Shoreland Zone:

Percent of residential lot coverage (Max 20%): N/A

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 structure: No new construction

Total new square feet paving/parking: No new paving/parking lot

Waiver Requests (attach details):

1. _____
2. _____
3. _____
4. _____
5. _____

Required Submittal Attachments:

A. Letters of Approval

Waiver Requested ☐ Fire Department – Contact Chief or Deputy Chief – 282-9986

Waiver Requested ☐ Ability to Serve for Water Service – Maine Water – 282-1543

Waiver Requested ☐ Ability to Serve for Sewer Service – Engineering Department – Tom Milligan 284-9118

Waiver Requested ☐ 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. Engineering Plans, as required.
- F. Stormwater Management Report, as required.

Fees (Due at time of Submission):

- \$75 Nonrefundable Administration Fee is required for every 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 its 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 the review for special studies, legal review costs, and/or engineering review.
- I understand that by submitting an 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.

Will the proposed project cause 1 acre or more of site disturbance?: ☐ (Yes) ☒ (No)

- If Yes, applicant is responsible for any required Maine Construction General Permits and shall comply with the requirements of DEP Chapter 500 Stormwater Regulations, as they apply.

Signature of Applicant: _____

Date 2/27/20204

Signature of Property Owner: _____

Date

2/19/2024

DIGITAL SUBMITTAL REQUIREMENTS FOR ALL SUBMITTALS:

- A) PDF OF SIGNED APPLICATION
- B) PDFs OF ALL DRAWING SETS AND OTHER REQUIRED SUBMITTAL ATTACHMENTS NOTED ABOVE

HARD-COPY SUBMITTAL REQUIREMENTS FOR PLANNING BOARD APPLICATIONS:

- A) SEVEN (7) FULL-SIZE PAPER COPIES OF DRAWING SETS

DIGITAL SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) INDIVIDUALLY NAMED PDFs OF EACH DRAWING (NOT A COMBINED PDF SET)
 - Individual Drawing PDF Naming Format: 'PROJECT/SHEETSET NAME_INDIVIDUAL DRAWING NAME.pdf'
- B) PDF COPIES OF ALL PERMIT APPROVALS, APPLICATIONS, REPORTS, NARRATIVES, LETTERS, ETC.
- C) FINAL CAD REFERENCE FILES IN DWG FORMAT (SURVEY & PROPOSED DESIGN LINEWORK)
 - All drawings & CAD reference files must be to-scale and within the following coordinate systems:
 - MAINE STATE PLANE WEST NAD83 (Horizontal Datum) & NAVD88 (Vertical Datum)

HARD-COPY SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

- A) THREE (3) FULL-SIZE PAPER COPIES OF INDIVIDUAL DRAWINGS REQUIRING BOARD SIGNATURE
- B) ONE (1) FULL-SIZE PAPER COPY OF ENTIRE DRAWING SET FOR ENGINEERING RECORDS

PLEASE CONFIRM WITH PLANNING STAFF FOR CLARIFICATION



Proof of Compliance with Performance Standards

JAR Cannabis Co.
Adult Use Marijuana Retail Store
420 Alfred St Unit 11
Biddeford, ME

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;

JAR's space will be remodeled in compliance with local, state and federal building codes. Our unit and building has a sprinkler system. All modifications to the sprinkler system will be review by the State Fire Marshall and inspected once complete by Biddeford Code Enforcement and Biddeford Fire Department.

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;

There is existing exterior via poles in the driveway, we will add additional commercial grade wall pack LED's controlled by a photocell that will be hard wired to our electrical panel.

4.

The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;

We do not propose any changes, on site landscaping already exists on the property.

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;

Our odor mitigation plan is included in our planning board application. Hours of operation will be 8am-9pm Monday-Sunday. Hours are consistent with other approved retail businesses in the I-3 zone.

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;

Our property is accessed via two traffic lights from Alfred St. The larger complex at Play 5 is mostly vacant. There is adequate ingress/egress infrastructure onto the property to ensure our use will not impact traffic on adjacent public streets.

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;

There will be no unreasonable traffic hazards or congestions. There is ample parking for our business and all other operating business currently in the Play 5 complex. There are two traffic lights controlling entry into the Play 5 complex.

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;

Our lease and operation of the space is an important component to our landlord developing and remodeling the rest of the Play 5 complex. Our landlord already has plans to improve the property which will increase the value of this property and adjacent properties.

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;

Our use will not impact the privacy of residents in the immediate area. There are no residential properties within 500 feet of our unit at 420 Alfred St.

10.

The proposed use would be in compliance with Biddeford's Comprehensive Plan;

The City Council has approved adult use marijuana retail in the I-3 zone, which is in line with the City'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;

We plan to remodel the inside of our unit, which will be minor renovations. Our landlord already has plans to improve the greater property at 420 Alfred St. JAR's remodel will not change the building size, height, or historical character. JAR's renovations will confirm with local, State and Federal codes.

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;

We do not propose any changes to the exterior of our building that would have impact on flood hazards.

13.

Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;

Our property is served by public water and sewer. Our unit will use that existing infrastructure in accord with local codes. There will be no changes specific to our use that would impact ground or surface water contamination.

14.

Adequate provision has been made to control erosion or sedimentation;

Not applicable. The unit we will operate is existing. JAR will be remodeling the interior of the unit.

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;

Not applicable. The unit and property we will operate is existing. JAR will be remodeling the interior of the unit. There will be no impact to stormwater runoff.

16.

The proposed water supply would meet the demands of the proposed use for fire protection purposes;

Yes.

17.

Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;

There will be no hazardous substances on site. JAR's internal procedure for handling marijuana waste is included in this application, in compliance with State regulations.

18.

The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification of the proposal;

Not applicable.

Performance Standards in the Revised Section 77 Marijuana Establishments:

A. All marijuana establishments shall be located indoors. Any common areas, including, but not limited to, storage areas and building facilities, shared with another marijuana establishment shall be clearly identified as such on the site plan or conditional use application.

Yes, our use is solely indoors.

Odor management. For all marijuana establishments, the odor of marijuana shall not be detectable off-premises, meaning not detectable on any property that is not under the control of the establishment. To prevent and control marijuana odors, an odor control plan shall be submitted as part of the site plan application describing the odor(s) originating or anticipated to originate at the premises and the control technologies to be used to prevent such odor(s) from leaving the premises. The odor control plan shall, at a minimum, include the following:

1.

A facility floor plan that identifies the locations of all odor-emitting activities and sources. The plan shall also identify the location of doors, windows, vents, HVAC systems, odor control systems and other relevant information.

See odor control plan included in this application. Our odor control system will be designed and installed by a licensee engineer and HVAC company. JAR has successfully controlled interior odors at all other retail stores and operations.

2.

A list of specific odor-emitting activities and sources, and a description of the processes that will take place at the facility, including, but not limited to, vegetative flowering, processing and storage.

The only odor emitting activities and sources specific to our use would be products that are unpackaged and placed in our sealed display cabinets, or from returned marijuana products from customers. In both scenarios, our HVAC system will be designed to mitigate odors caused by those activities.

3.

For each odor-emitting activity or source, a description of the administrative procedures as well as the engineering processes, technologies, and equipment the facility will use.

Included in this application.

a.

Administrative controls shall include, at a minimum: management practices to isolate odor activities and sources, use of standard operating procedures, employee training, regular equipment inspections and maintenance of inspection logs.

Included in this application.

b.

Engineering controls shall include, at a minimum, building design features; use of equipment and technology to address each specific odor-emitting activity or source; a systems and equipment maintenance and replacement schedule; and evidence that proposed equipment and technology are sufficiently capable and appropriately sized consistent with marijuana industry best practices for control technologies designed to effectively mitigate odors.

Marijuana establishments shall implement appropriate ventilation and filtration systems to satisfy the odor standard contained herein. While the City does not mandate any particular equipment specifications with regard to filtration, all marijuana establishments are strongly encouraged to adopt best management practices with regard to implementing state-of-the-art technologies in mitigating marijuana odor, such as air scrubbers and charcoal filtration systems.

Included in this application.

c.

Noxious gases and fumes. Marijuana establishments shall have appropriate ventilation systems to mitigate noxious gases or other fumes used or created as part of the establishment. Gases or fumes shall not extend beyond the premises of any establishment, meaning not detectable on any property that is not under the control of the establishment.

Included in this application.

d.

Sufficient measures and means of preventing smoke, debris, dust, fluids and other substances from exiting a marijuana establishment shall be provided at all times.

Not applicable to our adult use marijuana retail use. We will not produce smoke, debris, dust, fluids or other substances from our establishment.

e.

All marijuana and marijuana by-products intended for disposal shall be stored indoors in a self-contained room that is intended solely for this purpose and in accordance with all applicable federal, state and local laws and regulations. When moving material from the self-contained storage room for disposal, marijuana and marijuana by-products shall be moved only in receptacles with a cover or lid. Security cameras shall be installed to record

activities in the area of the storage room as well the areas between the storage room and where said material is loaded onto vehicle(s) for disposal.

Our waste disposal plan is included in this application, and conforms to this standard.

C.

Separation of marijuana establishments. No new marijuana establishment may be located within any building that is located within 500 feet of any other building containing a marijuana establishment.

We are more than 500 feet away from the closest marijuana establishment, which is Mr. Kind Guy Medical Caregiver Retail store.

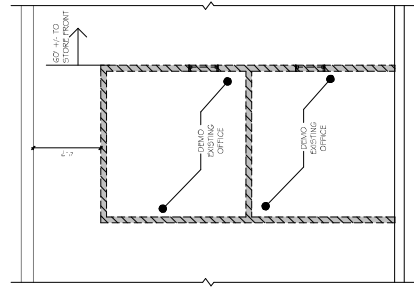
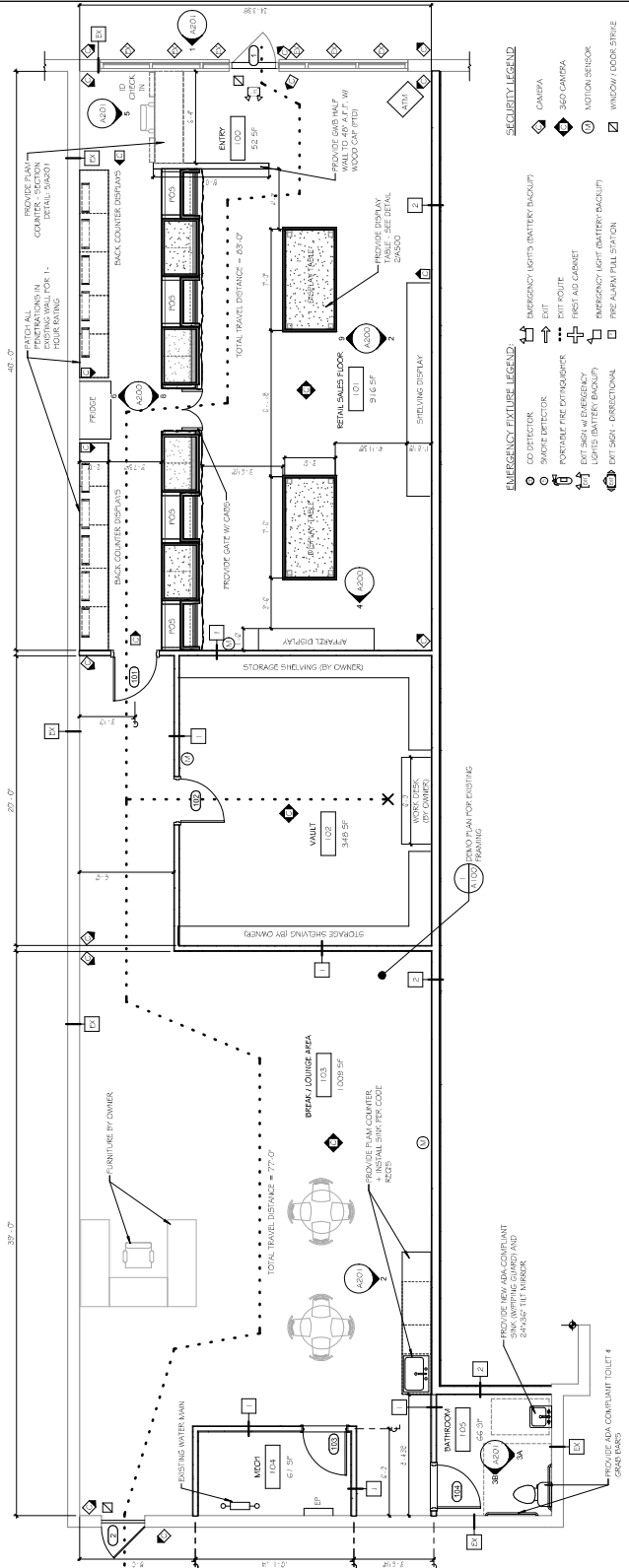
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JAR BIDDLEFORD
420 ALFRED ST
Biddleford, Maine 04005

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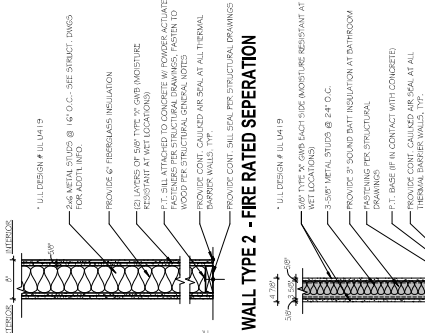
FOR NO.	2024XX	CHECKED BY	TRN
		DRAWN BY	ZML
SHEET TITLE			
DEMO & RENO PLAN			

A100



- NOTES:
1. CONTINUOUS BEAD OF ACOUSTICAL SOUND CAULKING AT EDGE OF DRYWALL AND ALL PENETRATIONS.
2. INSTALL FRAMING PER MANUFACTURER DETAILS AND SPECIFICATIONS.

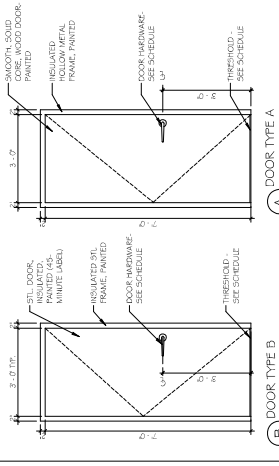
WALL TYPE 2 - FIRE RATED SEPERATION



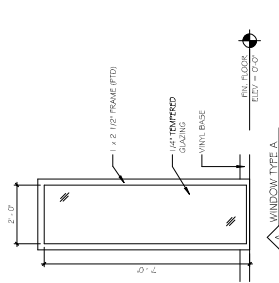
WALL TYPE 1 - INTERIOR FIRE RATED

MARK	ELEVATION	DOOR	DOOR SCHEDULE				THICKNESS	HARDWARE	UL RATING	NOTE
			FRAME MATERIAL	WORTH	HEIGHT	WIDTH				
1	10	STORAGE	STEEL	3'-0"	7'-0"	0'-11"	DET			
2	10	EMERGENCY EXIT	WSP STL	3'-0"	7'-0"	0'-11"	DET			
3	10	WSP	WSP	3'-0"	7'-0"	0'-11"	300P	1	VALZ	
4	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
5	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2	20 MIN	
6	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
7	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
8	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
9	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
10	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
11	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
12	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
13	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
14	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
15	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
16	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
17	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
18	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
19	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
20	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
21	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
22	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
23	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
24	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
25	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
26	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
27	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
28	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
29	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
30	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
31	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
32	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
33	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
34	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
35	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
36	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
37	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
38	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
39	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
40	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
41	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
42	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
43	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
44	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		
45	10	STL	WSP	3'-0"	7'-0"	0'-11"	300P	2		

- | Hardware Set #1 | Hardware Set #2 | Hardware Set #3 |
|----------------------------|----------------------------|----------------------------|
| INTERIOR PASSAGE DOOR | INTERIOR PASSAGE DOOR | INTERIOR PASSAGE DOOR |
| 3 BALL BEARING HINGES | 3 BALL BEARING HINGES | 3 BALL BEARING HINGES |
| 1 GRACI® PASSAGE LEVEL SET | 1 GRACI® PASSAGE LEVEL SET | 1 GRACI® PRIVACY LEVEL SET |
| 1 CLOSER | 1 CLOSER | 1 CLOSER |
| 1 DOOR STOP | 1 DOOR STOP | 1 DOOR STOP |
| 1 THRESHOLD | 1 THRESHOLD | 1 THRESHOLD |
- NOTE:**
 * PROVIDE IN WALL BLOCKING FOR ALL WALL MOUNTED DOOR STOPS



(A)	DOOR TYPE A
(B)	DOOR TYPE B

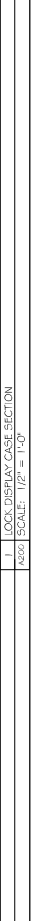


WINDOW TYPE A
INTERIOR SIDE LIGHT

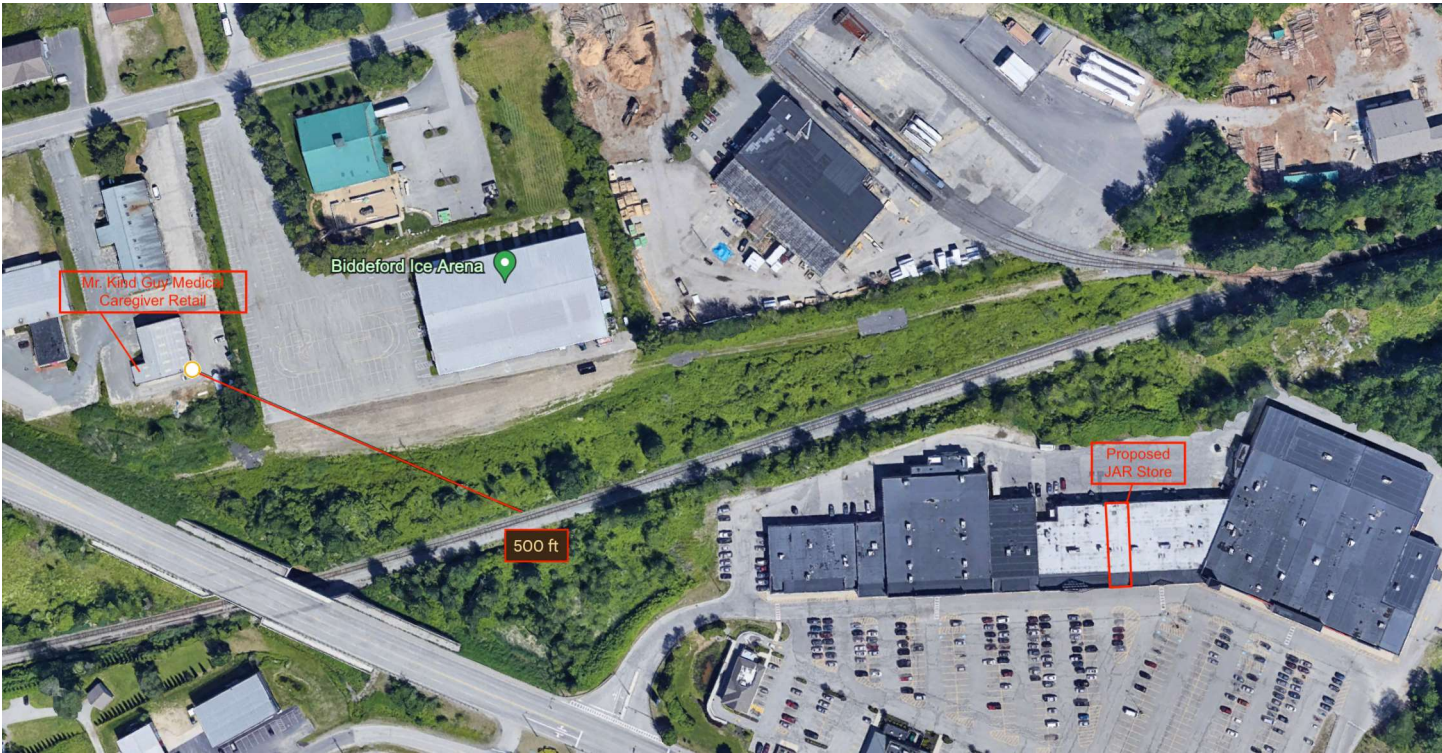
- GENERAL NOTES:**
1. ALL INTERIOR GLAZED DOORS TO HAVE 1" U AND SOLAR HEAT GAIN COEFFICIENTS THAT MEET ENERGY STAR REQUIREMENTS FOR CLIMATE ZONE AND HAVE AN LEAKAGE RATE (AL) OF .350 SWART OR LESS.
 2. UNLESS OTHERWISE NOTED, ALL DOORS WILL BE LOCATED CENTRAL TO THE WALL, OR 3' OFF FROM ADJACENT WALL, INSIDE TO THE OPENING.
 3. PROVIDE 2" BLOCKING ALL AROUND DOOR AND WINDOW OPENINGS.
 4. PROVIDE LOW EXPANSION FOAM BETWEEN DOOR FRAME & FLOOR.

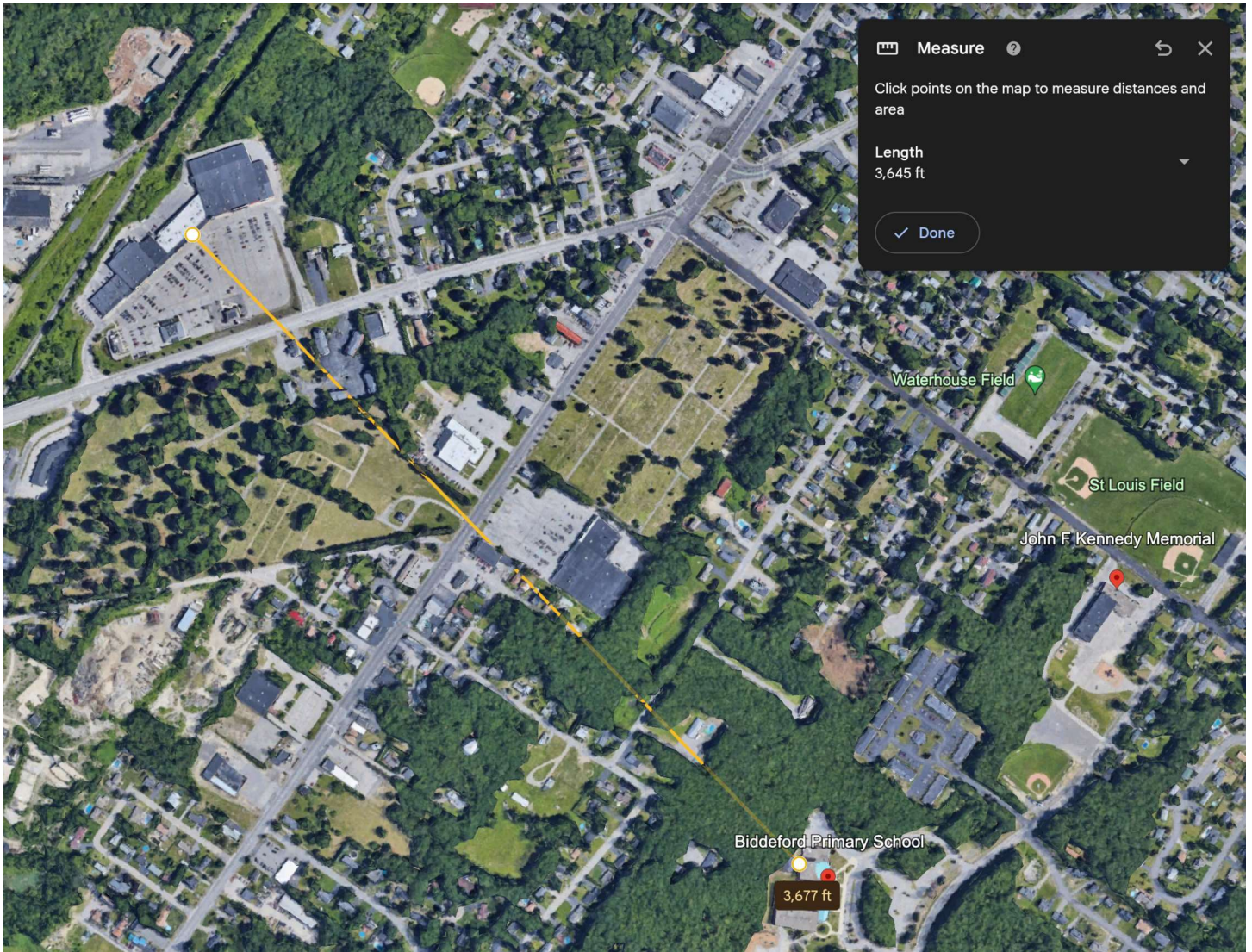
2	RENOVATION FLOOR PLAN
	SCALE: 1/4" = 1'-0"

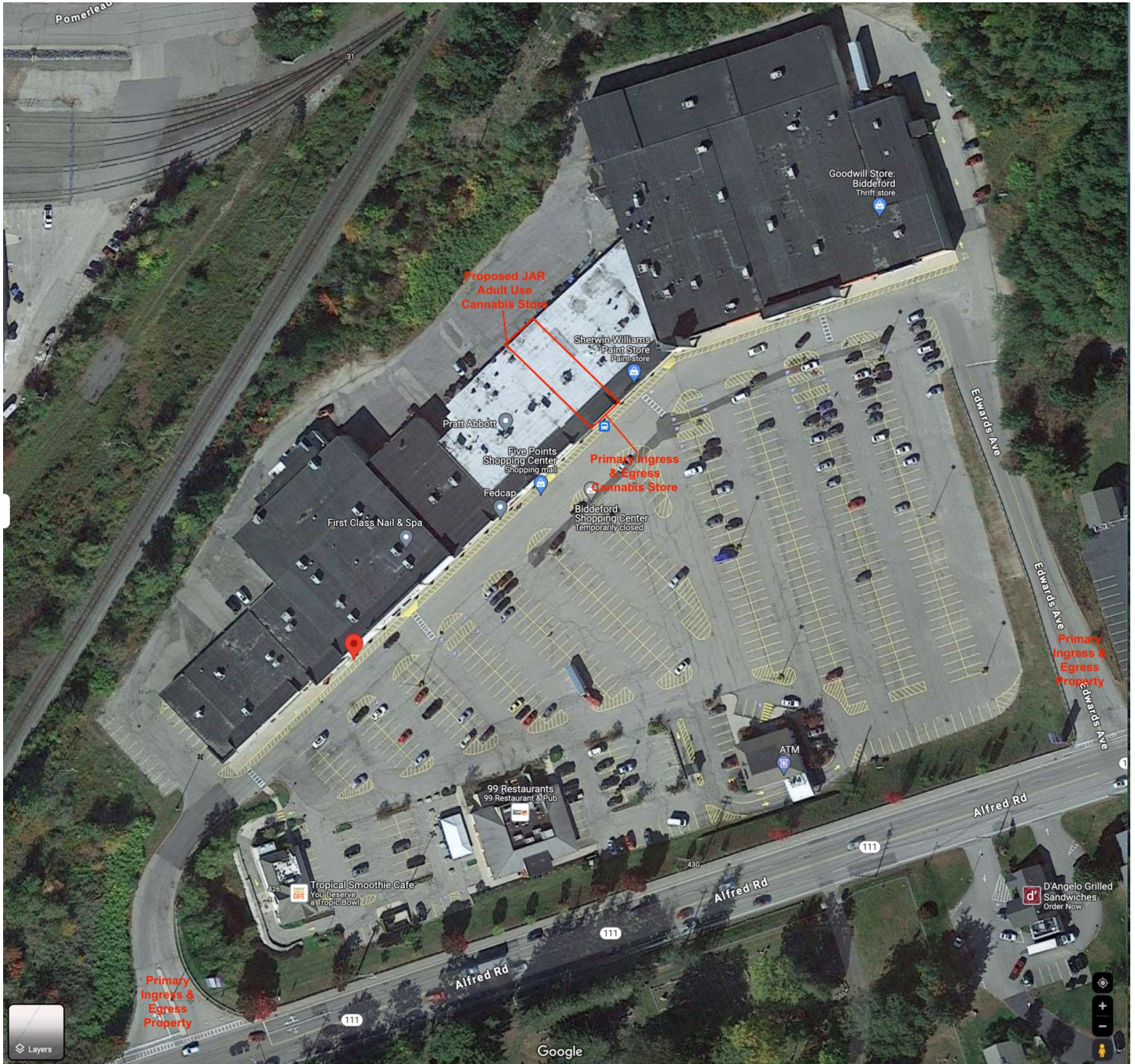
- | NOTES | | WINDOW TYPES |
|-------|--|--------------|
| | | 5 |



2	BREAK ROOM CABINET ELEVATION
A201	SCALE: 1/2" = 1'-0"









SOP: Waste Management

Purpose: To account for, track, and compliantly dispose of all waste marijuana and waste marijuana products monthly

Definitions:

- **Marijuana** - All stems, leaves, flower, seeds produced by the cannabis plant
- **Marijuana Product** - Marijuana concentrates and cartridges, edible marijuana, tinctures, and topicals
- **Waste** - Marijuana and marijuana products that have been returned, recalled, dropped, expired, or broken and can not be sold

Responsibilities:

- All Jar Co. retail managers must be trained on and follow this process
- It is the responsibility of the manager to ensure all employees are trained on the process of properly logging and wasting all marijuana and marijuana products, even CBD only products. It is also the managers responsibility to make sure the Waste log is printed and up-to-date.

Materials & Resources

Personnel: 2-3

Process Time: 10-20 minutes

Process Output: All marijuana and marijuana products shall be deemed unusable post waste destruction

Equipment:

- 5 gallon bucket with lid
- Bleach
- Soil
- Mixer
- Gloves
- safety attire

Notes:

This document is confidential and is owned by "Jar Co. Newry LLC."



- Returned products are never to be re-sold, sampled, or re-used in any form
- All expired products must be disposed of in accordance with this Procedure

Before Beginning:

- Account for all waste that is logged on waste chart
- Ensure there is a witness during disposal to secure the marijuana and marijuana products are completely destructed and unusable

A. Waste

1. Using the Waste log, track all marijuana and marijuana waste by date, product, amount/weight, reason, and name of employee who processed it
2. Once product is logged, put it into the designated waste bin
 - a. If the product is an edible, concentrate, or cartridge, open if possible, leaving all parts of container in waste bin

Waste Log				
Date/Time	Product	Amount/Weight	Reason	Processed By
Date Disposed:	Disposed of by:		Witness:	



3. Always make sure products have been taken out of inventory and wasted in the system

B. Waste Destruction

1. Once a month, the manager and a witness need to destruct the waste bin
2. Use a designated location out of sight of foot traffic but in visible sight of security camera
3. To waste product compliantly:
 - a. Dump all waste into the designated 5 gallon bucket
 - b. Using mixer, carefully break up any flower or cartridge to allow access of bleach and soil
 - c. Add in double the amount of soil to product
 - d. Pour in adequate amount of bleach to where all product and soil is fully soaked through
 - e. Continue to mix until all product is unrecognizable and can not be used
 - f. Carefully dump mixture into a trash bag, and then double bag and take to dumpster
 - g. Always make sure dumpster remains locked
4. After waste is properly disposed of, the manager and witness need to sign off on the sheet
5. The completed log needs to remain in the waste log binder
6. Make sure a new sheet is printed out and put in binder for the following month



Odor Control Plan

JAR Cannabis Co.

Adult Use Marijuana Retail Store

420 Alfred Street Unit 11 Biddeford, ME

JAR Cannabis Company has successfully controlled odors at six other active adult use & medical retail stores in Maine. JAR retail stores have specialized HVAC systems designed and installed that utilize slight negative pressure and carbon filtration to control odors. Additionally, all products received into the store are sealed and pre-packaged. Our HVAC contractor further describes the system we will install at 420 Alfred Street Unit 11 in Biddeford:

Dear Joel,

Thank you for the opportunity to design the odor mitigation system for your proposed retail space located at 420 Alfred St in Biddeford Maine.

In order to control odor from the cannabis, the first line of defense is the product packaging. Keeping the product in sealed containers is the best way to keep the odor under control. You have reassured me that this is in fact the case, so that's a great start.

The next line of defense is keeping the retail space in a slight negative pressure. This helps ensure that any odor does not exfiltrate from your space to neighboring tenants or to the outside. We create this negative pressure using a ducted fan system with balanced airflows.

Simultaneously, the air in the space is constantly recirculated through a commercial grade activated carbon filter housing. The carbon absorbs odors from the air passing through it. Regularly scheduled filter replacement will ensure the system continues to operate at peak efficiency.

As an added line of defense, I have added carbon impregnated pleated filters to the split-type air conditioner serving the space. Detailed info about the components are below:

FRESH AIR REQUIRED CALCULATION

$$V_{bz} = R_p P_z + R_a A_z \quad (\text{Equation 4-1})$$

where:

A_z = Zone floor area: the *net occupiable floor area* of the space or spaces in the zone.

P_z = Zone population: the number of people in the space or spaces in the zone.

R_p = People outdoor air rate: the outdoor airflow rate required per person from Table 403.3.1.1.

R_a = Area outdoor air rate: the outdoor airflow rate required per unit area from Table 403.3.1.1.

PER 2018 IMC

$A_z = 575$ SQ-FT SALES FLOOR AREA

$P_z = 15 \times \left(\frac{575}{1000}\right) = 8.7$

$R_p = 7.5$

$R_a = 0.12$

$V_{bz} = R_p P_z + R_a A_z = (7.5)(9) + (0.12)(575)$

OUTSIDE AIR REQUIRED = 137 CFM

TABLE 403.3.1.1
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT ² *	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT ² *	EXHAUST AIRFLOW RATE CFM/FT ² *
Retail stores, sales floors and showroom floors				
Dressing rooms	—	—	—	0.25
Mall common areas	40	7.5	0.06	—
Sales	15	7.5	0.12	—
Shipping and receiving	2	10	0.12	—
Smoking lounges ^b	70	60	—	—
Storage rooms	—	—	0.12	—
Warehouses (see "Storage")	—	10	0.06	—

Toilet rooms — public | — | — | — | 50/70

e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

g. Mechanical exhaust is required and recirculation from such spaces is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Items 2 and 4).



Camsorb® Canister Glide/Pack®

Heavy-duty side access adsorber housing

Each 24" by 24" section holds sixteen canisters of carbon or other selected adsorbents to remove a variety of gaseous contaminants

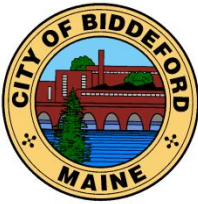
Uses Camsorb Canisters for the highest mechanical efficiency available (see Literature # 2112)

Airflow may be in either direction. Integral particulate filter track may be applied as a prefilter or after filter

Weatherproof construction with dual access doors for filter change from either side of the housing

See Literature # 2118

ODOR CONTROL FILTER



CITY OF BIDDEFORD

Planning and Development Department

David CM Galbraith
City Planner/Deputy Director
205 Main Street
P.O. Box 586
Biddeford, ME 04005
(207) 284-9115
david.galbraith@biddefordmaine.or

PLANNING BOARD REPORT

TO: Larry Patoine, Chair & the Biddeford Planning Board

FROM: David CM Galbraith, City Planner / Deputy Director of Planning

DATE: May 6, 2024

RE: **2024.24 Conditional Use Permit for a Fitness Center/Gym for Orange Fitness at 420 Alfred Street, 5 Points Shopping Center (Tax Map 20, Lot 26-1) in the I-3 Zone.**

MEETING DATE: May 15, 2024 @ 6:00 PM

1. INTRODUCTION

The Applicant, Orange Fitness, is seeking Planning Board approval for a Fitness Center/Gym at 420 Alfred Street (Property ID # Map 20, Lot 26-1). The subject property is 5 Points Shopping Center, is zoned I-3. The applicant, Orange Fitness (Patrick Welch) opened the previous fitness center in the same space. Welch sold the original business (Planet Fitness) which was then moved to another location.

The applicant intends to operate the new fitness center in the aforementioned Planet Fitness space with no changes to any structures, electrical and plumbing. The applicant intends to make only cosmetic changes. As outlined in the proposal's application:

Request for conditional use permit:

At 420 Alfred street Biddeford Maine 04005 (for new fitness center located in previous Planet Fitness space at the 5 points Shopping Center).

The 10,500 sqft end cap space located at the 5 points mall was originally developed as a Gold's Gym franchise from 1999 to 2004 and converted to a Planet Fitness franchise in 2004 by the applicant (Patrick Welch / Orange Fitness DBA OCF Fitness) both previous fitness center operations were owned / built and operated by Patrick Welch and his entities at the 420 Alfred Street location until 2014 until Welch sold the Planet Fitness business and the new owner / operator relocated the business to the "Old Shaws Building" on Alfred Street.

Applicant (Patrick Welch / orange fitness) intends to operate the new fitness center (orange fitness dba OCF Fitness) in the aforementioned "Old Planet Fitness" space with no changes to any structures, electrical, plumbing. It will be "as is" with the same layout and business use as before (fitness center). Only cosmetic changes / made (ie), paint, floor & wall coverings, signage etc. It was brought to our attention the original conditional use permit expired when Planet Fitness relocated to the "Old Shaws Building" on Alfred street.

2024.24 Conditional Use Permit for a Fitness Center/Gym for Orange Fitness at 420 Alfred Street, (Tax Map 20, Lot 26-1) in the I-3 Zone.
Planning Board Hearing Date: May 15, 2024

Staff does not foresee any issues with this operation at this established location.

2. **PROJECT DATA**

	SUBJECT	DATA/INFORMATION
1.	Applicant:	Orange Fitness 75 Westminster Street Lewiston, ME 04240
2.	Owner of Property:	BVH Biddeford, LLC 2 Livewell Drive, Suite 201 Kennebunk, ME 04043
3.	Surveyor/Engineer:	N/A
4.	Project Location:	420 Alfred Street
5.	Project Tax Map #/Lot #:	20/26-1
6.	Existing Zoning:	I-3 – Fitness Center/Gym is a Conditional Use
7.	Overlay Zoning:	None
8.	Existing Use:	
9.	Proposed Use:	Establishment of a new Fitness Center/Gym
10.	Approvals Required:	Conditional Use
11.	Uses in the Vicinity:	Commercial/Industrial
12.	Number of Lots/Units in Subdivision:	N/A
13.	Minimum Lot Size Required: Provided:	None 1.6 acres
14.	Frontage Required: Provided:	50' 305' +/-
15.	Front Setback Required: Provided:	40' >40'
16.	Side Setbacks Required: Provided:	25' >25'
17.	Rear Setback Requires: Provided:	25' >25'
18.	Height Requirements: Provided:	60 feet or 6 stories. < 60 feet
19.	Water Supply:	Maine Water Company
20.	Sewerage Disposal:	City of Biddeford
21.	Solid Waste Disposal:	Private Hauler
22.	Fire Protection:	City of Biddeford
23.	Floodplain Status:	Property is not within a NFIP Zone A or V flood zone
24.	Wetland/Surface Water Impacts:	None
25.	Soil Study Provided:	N/A
26.	Parking Spaces Required:	
27.	Parking Spaces Provided (total): # Handicapped Spaces:	
28.	Ownership of Road:	Alfred Street is a Public Road
29.	Impervious Surface Area:	0 SF Change

2024.24 Conditional Use Permit for a Fitness Center/Gym for Orange Fitness at 420 Alfred Street, (Tax Map 20, Lot 26-1) in the I-3 Zone.

Planning Board Hearing Date: May 15, 2024

30.	Total Disturbed Area:	0 SF of previously undisturbed area.
31.	Estimated Site Development Costs:	N/A
35.	Financial Capacity Letter:	N/A – Internal Construction Only
36.	Waivers Requested/Needed:	a. Article XI, Full Site Plan Review as per Article XI, Section 9.B.2.
37.	Waivers Granted:	
38.	Variances Needed for Approval:	None.
39.	Other Permits Obtained:	Conditional Adult Use Cannabis Permit
40.	Other Non-City Permits Required:	None.
41.	Covenants, By-laws, Restrictions Required:	None
42.	LDR Attachment A: Fees Paid:	Yes
42.		
43.	Planning Board Review History: Conditional Use Permit	May 15, 2024

3. **EXISTING CONDITIONS**

The site is a fully developed partially vacant shopping center and associated parking.

4. **PROJECT PROPOSAL**

Fitness Center/Gym. The proposed Orange Fitness is proposing to take over the prior Planet Fitness tenant space.

5. **OUTSTANDING ISSUES TO BE ADDRESSED PRIOR TO APPROVAL:**

6. **STAFF REVIEW**

a. **ZONING:** There is no minimum lot size.

b. **SEWER CAPACITY:** One of the issues raised during the review of this application and the other pending applications for the Five Points Shopping Center is the capacity of the sewer line that transfers the sewer from the subject property into the City's sewer line that runs behind the shopping center. The City continues to review sewer capacity in this line, however, providing the sewer demands are the same or less than the prior tenant usage it has been determined that the sewer can accommodate the proposed use. Below is a sewer capacity comparison of the proposed Orange Fitness compared to the prior use, also a fitness center (Planet Fitness). The below sewer demand illustrates the same sewer demand as the prior use so Staff does not have a concern with the proposed use or their sewer demand.

2024.24 Conditional Use Permit for a Fitness Center/Gym for Orange Fitness at 420 Alfred Street, (Tax Map 20, Lot 26-1) in the I-3 Zone.

Planning Board Hearing Date: May 15, 2024

Fitness and Exercise Center (<i>Orange Circuit Fitness</i>)	50 gpd per 100 sq. ft.	50 gpd	100	-	-	5,000
*Fitness and Exercise Center (<i>Planet Fitness</i>)	50 gpd per 100 sq. ft.	50 gpd	100	-	-	5,000

- c. REVIEW STANDARDS: The project is subject to the Conditional Use Standards listed below:

Section 6 Standards:

- A.** Applications for conditional use permits must meet the standards specified in Article VI of this ordinance as well as the standards of subdivision or site review. In addition, because of the unique nature and particular concern that the general public may have relating to a conditional use in a particular zone, the Planning Board shall consider each of the applications in light of the guidelines presented below.
- B.** The Planning Board shall approve, approve with conditions, or deny all applications for a conditional use permit. The applicant shall have the burden of proving that his or her application is in compliance with the requirements of this ordinance and that none of the conditions listed below would result from the approval of the conditional use permit. Failure of the applicant to submit required information shall constitute a basis for denial without a review of the remainder of the application. After the submission of a complete application and a review of the required submissions, the Planning Board shall approve the application or approve it with conditions if the application meets the following standards:
1. The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws;

The proposed use will comply with all State and local Codes and Ordinances.

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;

The site is an existing developed site was previously reviewed and approved by the Planning Board.

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;

2024.24 Conditional Use Permit for a Fitness Center/Gym for Orange Fitness at 420 Alfred Street, (Tax Map 20, Lot 26-1) in the I-3 Zone.
Planning Board Hearing Date: May 15, 2024

The applicant does not intend to install any additional exterior lighting and the location is in a discreet location with no known existing lighting issues.

4. The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;

There is no development proposed by this project and the site is located in a business/industrial area and the proposed use will be located within an existing, approved shopping center.

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;

The proposed use as a fitness center is not expected to generate any noise, vibrations, fumes, odor, dust, glare, hours of operation, or other causes that will have any detrimental effect on surrounding uses.

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;

The site and proposed tenant space have two points of vehicle access on to Alfred Road, which has adequate capacity to serve the proposed use.

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;

The proposed use will have the same parking and traffic demand as was previously operating from this location without incident.

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;

Adjacent parcels are industrial/commercial. The operation should not change in any way that may impact this standard negatively given the recommended Conditions of Approval and existing Performance Standards.

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;

2024.24 Conditional Use Permit for a Fitness Center/Gym for Orange Fitness at 420 Alfred Street, (Tax Map 20, Lot 26-1) in the I-3 Zone.
Planning Board Hearing Date: May 15, 2024

The proposed use is proposed to be located within an existing shopping center and will not impact the privacy of the immediate area.

10. The proposed use would be in compliance with Biddeford's Comprehensive Plan;

Although the Comprehensive Plan does not specifically address fitness centers, this type of use is permitted in the I-3 zone as per the Future Land Use Plan of the 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;

There are no modifications to the Site or the building's exterior proposed.

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;

The property is not located in a flood zone.

13. Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;

The tenant space will be served by Maine Water. As previously mentioned, the shopping center is connected to one of the City's sewer lines that is close to capacity. The proposed use is the same type of use as the previous tenant and as such the applicant's proposal can be accommodated.

14. Adequate provision has been made to control erosion or sedimentation;

N/A. This proposal is for an interior remodel so erosion control measures are not required.

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;

There are no site improvements/disturbances proposed that would affect existing stormwater system.

16. The proposed water supply would meet the demands of the proposed use for fire protection purposes;

Maine Water Company serves this site and has provided an Ability to Serve letter.

2024.24 Conditional Use Permit for a Fitness Center/Gym for Orange Fitness at 420 Alfred Street, (Tax Map 20, Lot 26-1) in the I-3 Zone.
Planning Board Hearing Date: May 15, 2024

17. Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;

The applicant has indicated there will not be a presence of hazardous substances, and if there were, State Law must be adhered.

18. The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification of the proposal;

N/A The proposed use is to be located in the middle tenant space of the existing Five Points Shopping Center. No site alterations are proposed for the site.

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.

The parcel is not located in a Shoreland Zone.

d. **WAIVERS REQUESTED / REQUIRED:** Article XI, Full Site Plan Review.

Staff Recommendation: Given there are no building expansions proposed and not increase in impervious surface proposed Staff recommend the Board grant this waiver which says that sufficient information has been provided to consider this application for review.

7. **NEXT STEPS/SUGGESTED ACTIONS**

Recommend the Planning Board grant the waiver request for a full site plan review submittal given no site alterations are proposed.

Recommend that if the Planning Board approves the Conditional Use Permit it be approved with the following minimum conditions of approval:

1. Standard Conditions of Approval apply.
2. The applicant shall obtain all other pertinent local, state and federal permits/licenses/insurance such as building, electrical, plumbing, etc., prior to commencing business.

8. **SAMPLE MOTIONS:**

- I. Motion to waive Article XI, Full Site Plan Review. *I motion to waive Article XI, full site plan review, as no site improvements are being made.*
- II. Motion to approve the Conditional Use Permit and the Findings of Fact and Conclusions of Law for Orange Fitness for Fitness Center/Gym at 420 Alfred Street (Tax Map 20, Lot 26-1).

2024.24 Conditional Use Permit for a Fitness Center/Gym for Orange Fitness at 420 Alfred Street, (Tax Map 20, Lot 26-1) in the I-3 Zone.

Planning Board Hearing Date: May 15, 2024

III. Motion to Table the Conditional Use Permit and the Findings of Fact and Conclusions of Law for Orange Fitness for a Fitness Center/Gym at 420 Alfred Street(Tax Map 20, Lot 26-1), based upon the following reasons:

a) _____

b) _____

c) _____

IV. Motion to deny the Conditional Use Permit and the Findings of Fact and Conclusions of Law for Orange Fitness for Fitness Center/Gym at 420 Alfred Street(Tax Map 20, Lot 26-1), based upon the following reasons:

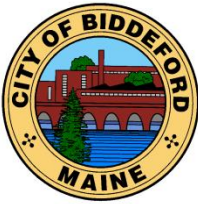
a) _____

b) _____

c) _____

ATTACHMENTS

1. Conditional Use Permit Application Package
2. Draft Findings of Fact and Conclusions of Law



CITY OF BIDDEFORD

Planning and Development Department

FINDINGS OF FACT AND CONCLUSIONS OF LAW

Conditional Use Permit

Fitness Center/Gym

Orange Fitness 420 Alfred Street, Biddeford, ME

Case # 2024.24 – May 15, 2024

Pursuant to the provisions of the City of Biddeford Land Development Regulations, Article VI (Performance Standards), Section 18 – Commercial Recreation Activities, the Biddeford Planning Board has considered the application of Orange Fitness to open a fitness center/gym in an existing building that formerly housed a gym, 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:

1. Project Data:

	<i>SUBJECT</i>	<i>DATA/INFORMATION</i>
1.	Applicant:	Orange Fitness PO Box 152 Saco, ME 04072
2.	Owner of Property:	BVH Biddeford, LLC 2 Livewell Dr. Suite 201 Kennebunk, ME 04043
3.	Surveyor/Engineer:	N/A
4.	Project Location:	420 Alfred Street
5.	Project Tax Map #/Lot #:	20/26-1
6.	Existing Zoning:	I-3 Commercial Recreation Facility is a Conditional Use in I-3
7.	Overlay Zoning:	None
8.	Existing Use:	Vacant former gym
9.	Proposed Use:	Establishment of a new Fitness Facility/Gym
10.	Approvals Required:	Conditional Use
11.	Uses in the Vicinity:	Commercial/Industrial/Residential
12.	Number of Lots/Units in Subdivision:	N/A
13.	Minimum Lot Size Required: Provided:	None 1.22 acres
14.	Frontage Required: Provided:	50' 190' +/-
15.	Front Setback Required: Provided:	40' >40'
16.	Side Setbacks Required: Provided:	25' >25'
17.	Rear Setback Requires: Provided:	25' >25'
18.	Height Requirements: Provided:	60 feet or 6 stories. < 60 feet
19.	Water Supply:	Maine Water Company
20.	Sewerage Disposal:	City of Biddeford

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Conditional Use Permit
Fitness Center/Gym
Orange Fitness 420 Alfred Street, Biddeford, ME
Case # 2024.24

21.	Solid Waste Disposal:	Private Hauler
22.	Fire Protection:	City of Biddeford
23.	Floodplain Status:	Property is not within a NFIP Zone A or V flood zone
24.	Wetland/Surface Water Impacts:	None
25.	Soil Study Provided:	N/A
26.	Parking Spaces Required:	
27.	Parking Spaces Provided (total): # Handicapped Spaces:	
28.	Ownership of Road:	Alfred Street is a Public Road
29.	Impervious Surface Area:	0 SF Change
30.	Total Disturbed Area:	0 SF of previously undisturbed area.
31.	Estimated Site Development Costs:	N/A
35.	Financial Capacity Letter:	N/A – Internal Construction Only
36.	Waivers Requested/Needed:	a. Article XI, Full Site Plan Review as per Article XI, Section 9.B.2.
37.	Waivers Granted:	
38.	Variances Needed for Approval:	None.
39.	Other Permits Obtained:	N/A
40.	Other Non-City Permits Required:	None.
41.	Covenants, By-laws, Restrictions Required:	None
42.	LDR Attachment A: Fees Paid:	Yes
42.		
43.	Planning Board Review History: Conditional Use Permit	May 15, 2024

2. **Performance Standards:** The Board made the following conclusions in their review standards of Article VI (Performance Standards), Section 18 (Commercial Recreation) states as follows:

1. The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws;

The proposed use will comply with all State and local Codes and Ordinances.

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;

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Conditional Use Permit
Fitness Center/Gym
Orange Fitness 420 Alfred Street, Biddeford, ME
Case # 2024.24

The site is an existing developed site was previously reviewed and approved by the Planning Board.

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;

The applicant does not intend to install any additional exterior lighting and the location is in a discreet location with no known existing lighting issues.

4. The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;

There is no development proposed by this project and the site is located in a business/industrial area and the proposed use will be located within an existing, approved shopping center.

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;

The proposed use as a fitness center is not expected to generate any noise, vibrations, fumes, odor, dust, glare, hours of operation, or other causes that will have any detrimental effect on surrounding uses.

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;

The site and proposed tenant space have two points of vehicle access on to Alfred Road, which has adequate capacity to serve the proposed use.

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;

The proposed use will have the same parking and traffic demand as was previously operating from this location without incident.

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;

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Conditional Use Permit
Fitness Center/Gym
Orange Fitness 420 Alfred Street, Biddeford, ME
Case # 2024.24

Adjacent parcels are industrial/commercial. The operation should not change in any way that may impact this standard negatively given the recommended Conditions of Approval and existing Performance Standards.

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;

The proposed use is proposed to be located within an existing shopping center and will not impact the privacy of the immediate area.

10. The proposed use would be in compliance with Biddeford's Comprehensive Plan;

Although the Comprehensive Plan does not specifically address fitness centers, this type of use is permitted in the I-3 zone as per the Future Land Use Plan of the 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;

There are no modifications to the Site or the building's exterior proposed.

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;

The property is not located in a flood zone.

13. Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;

The tenant space will be served by Maine Water. As previously mentioned, the shopping center is connected to one of the City's sewer lines that is close to capacity. The proposed use is the same type of use as the previous tenant and as such the applicant's proposal can be accommodated.

14. Adequate provision has been made to control erosion or sedimentation;

N/A. This proposal is for an interior remodel so erosion control measures are not required.

FINDINGS OF FACT AND CONCLUSIONS OF LAW
Conditional Use Permit
Fitness Center/Gym
Orange Fitness 420 Alfred Street, Biddeford, ME
Case # 2024.24

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;

There are no site improvements/disturbances proposed that would affect existing stormwater system.

16. The proposed water supply would meet the demands of the proposed use for fire protection purposes;

Maine Water Company serves this site and has provided an Ability to Serve letter.

17. Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;

The applicant has indicated there will not be a presence of hazardous substances, and if there were, State Law must be adhered.

18. The proposed use would not have an adverse impact on scenic vistas or on significant wildlife habitat or wetland areas and water bodies which could be avoided by reasonable modification of the proposal;

N/A The proposed use is to be located in the middle tenant space of the existing Five Points Shopping Center. No site alterations are proposed for the site.

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.

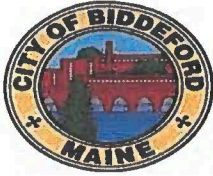
The parcel is not located in a Shoreland Zone.

APPROVAL GRANTED: Based on the evidence available and the conclusions above, the Biddeford Planning Board approves the Conditional Use Permit for the proposed project summarized above, located at 420 Alfred Street in accordance with the submitted application, supporting data, representations made, other related materials on file, and the following Conditions of Approval:

1. Standard Conditions of Approval apply.
2. All conditions previously approved by the Planning Board for uses located within the Five Points Shopping Center are hereby reaffirmed.

Mr. Larry Patoine, Planning Board Chair

Date:



City of Biddeford – Planning Department

Planning Board Application

P.O. Box 586, 205 Main Street Biddeford, Maine 04005

207-284-9115

Revised: May 17, 2022

2024.24

Type of Application:

☐ Shoreland Zoning Permit

☐ Site Plan Review

☐ Extraction

☒ Conditional Use Permit

☐ Subdivision

☐ Private Way

☐ Other: _____

Applicant Information:

Name: Orange Fitness

Mailing Address: P.O. Box 152 Saco ME 04072

Telephone: 207-281-3812

Email: Patrick.Welch04072@hotmail.com

What is your legal interest in the property?

☐ Owner

☐ Potential Buyer with Contract

☒ Lease/Rental Agreement

Owner's Information:

Name: SVH, LLC

Mailing Address: 7 Shape Drive, Suite 201 Kennebunk ME

Telephone: _____

Email: Kevin.Harrison@atlanticholdings.net

Agent's Information:

Name: _____

Mailing Address: _____

Telephone: _____

Email: _____

Engineer/Surveyor's Information:

Name: _____

Mailing Address: _____

Telephone: _____

Email: _____

Project Location and Lot Information:

Street Address: 420 Alfred Street / Spring Hill Drainage Watershed: _____

Tax Map: 20

Lot: 26-1

Current Zoning: I-3

Shoreland Zoning: _____

Size of Lot: _____ () acres () s.f.

Lot Frontage: _____

Existing Use of Property: _____

Property currently serviced by:

☒ City Road

☒ Public Sewer

☒ Public Water

☐ Public Trash

☐ Private Road ☐ Septic System

☐ Private Well

☐ 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

Is the project within the 100-year floodplain? ☐ (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:

Fitness Center / Gym

Property to be Serviced by:

☒ City Road ☒ Public Sewer ☒ Public Water ☐ Public Trash
☐ Private Road ☐ Septic System ☐ Private Well ☐ Private Hauler

Limits of Disturbance: _____ () acres () s.f.

Net change in impervious cover: _____ () acres () s.f.

Is this project part of a larger project? ☐ (Yes) ☐ (No)

Is the project proposing a new Private or Public Road? ☐ (Yes, Private) ☐ (Yes, Public) ☐ (No)

Is this project within the Urbanized Area/MS4 (see [City Drainage Map](#)) ☐ (Yes) ☐ (No)

Is the project proposing any Stormwater facilities/BMPs? ☐ (Yes) ☐ (No)

Will a Traffic Movement Permit (TMP) be required?: ☐ (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 structure: _____

Total new square feet paving/parking: _____

Waiver Requests (attach details):

1. _____
2. _____
3. _____
4. _____
5. _____

Required Submittal 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 Department – 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. Engineering Plans, as required.
- F. Stormwater Management Report, as required.

Fees (Due at time of Submission):

- \$75 Nonrefundable Administration Fee is required for every application.
- Refer to “Attachment A Fees and Charges” of the Land Development Regulations for more information. Consult with Planning Staff if you have questions.

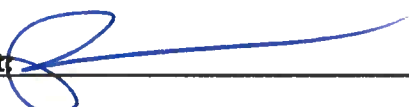
Required Signatures:

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 its 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 the review for special studies, legal review costs, and/or engineering review.
- I understand that by submitting an 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.

Will the proposed project cause 1 acre or more of site disturbance?: __ (Yes) ☒ (No)

- If Yes, applicant is responsible for any required Maine Construction General Permits and shall comply with the requirements of DEP Chapter 500 Stormwater Regulations, as they apply.

Signature of Applicant: 

Date

3/22/24

Signature of Property Owner: _____

Date _____

DIGITAL SUBMITTAL REQUIREMENTS FOR ALL SUBMITTALS:

A) PDF OF SIGNED APPLICATION

B) PDFs OF ALL DRAWING SETS AND OTHER REQUIRED SUBMITTAL ATTACHMENTS NOTED ABOVE

HARD-COPY SUBMITTAL REQUIREMENTS FOR PLANNING BOARD APPLICATIONS:

A) SEVEN (7) FULL-SIZE PAPER COPIES OF DRAWING SETS

DIGITAL SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

A) INDIVIDUALLY NAMED PDFs OF EACH DRAWING (NOT A COMBINED PDF SET)

- Individual Drawing PDF Naming Format: 'PROJECT/SHEETSET NAME_ INDIVIDUAL DRAWING NAME.pdf'

B) PDF COPIES OF ALL PERMIT APPROVALS, APPLICATIONS, REPORTS, NARRATIVES, LETTERS, ETC.

C) FINAL CAD REFERENCE FILES IN DWG FORMAT (SURVEY & PROPOSED DESIGN LINEWORK)

- All drawings & CAD reference files must be to-scale and within the following coordinate systems:

- MAINE STATE PLANE WEST NAD83 (Horizontal Datum) & NAVD88 (Vertical Datum)

HARD-COPY SUBMITTAL REQUIREMENTS FOR FINAL APPROVAL:

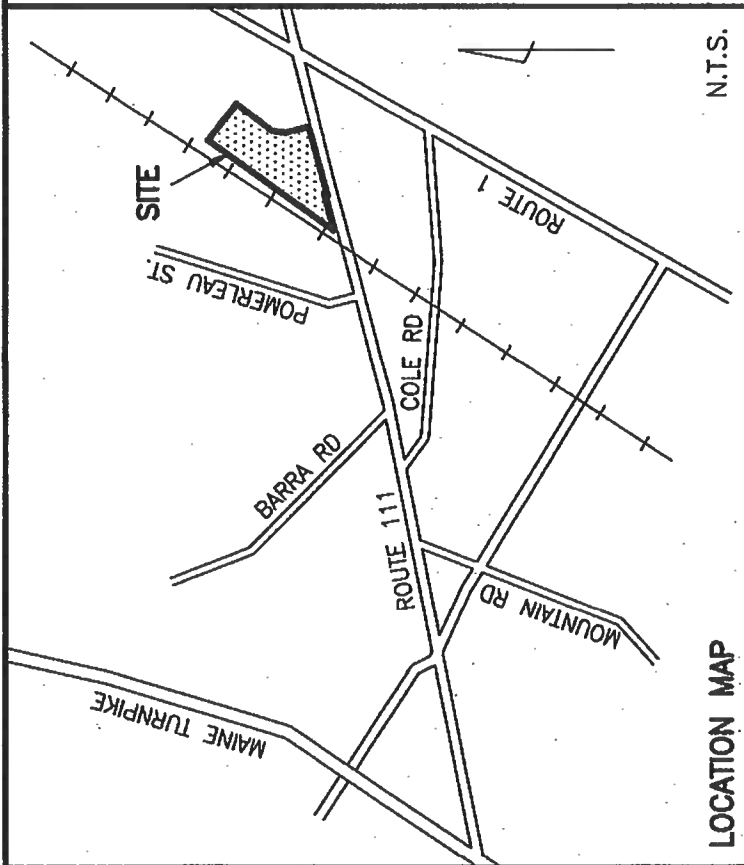
A) THREE (3) FULL-SIZE PAPER COPIES OF INDIVIDUAL DRAWINGS REQUIRING BOARD SIGNATURE

B) ONE (1) FULL-SIZE PAPER COPY OF ENTIRE DRAWING SET FOR ENGINEERING RECORDS

PLEASE CONFIRM WITH PLANNING STAFF FOR CLARIFICATION

NOTES

1. OWNER OF RECORD:
BVH BIDDEFORD, LLC, 7 SHAPE DRIVE, SUITE 201, KENNEBEC
Y.C.R.D. BOOK 14143 PAGE 173
2. PARCEL IS SHOWN AS LOTS 26-1 AND 26-2 ON THE CITY
ASSESSORS MAP 20.
2. BEARINGS ARE PER MARKERS FOUND AS SHOWN ON PLAN R
3. REFERENCE IS MADE TO A NOTICE OF LAYOUT AND TAKING F
IN BOOK 12616 PAGE 54.



LEGAL DESCRIPTION

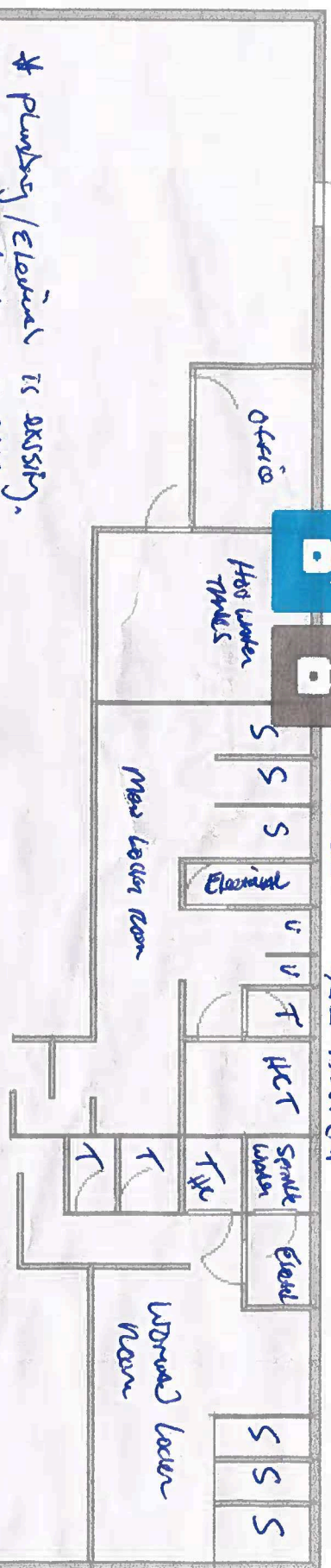
THAT CERTAIN PARCEL OR TRACT OF LAND WITH ALL BUILDINGS AND IMPROVEMENTS SITUATED ON THE NORTHERLY SIDE OF ALFRED ROAD IN THE CITY OF BIDDEFORD, COUNTY OF YORK, STATE OF MAINE AND IS BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A CONCRETE MONUMENT SITUATED 70.00 FEET NORTHERLY OF AND PERPENDICULAR TO P.C. STATION 818 + 22.01, AS SHOWN ON MAINE STATE HIGHWAY COMMISSION RIGHT OF WAY MAP STATE HIGHWAY "J" BIDDEFORD, YORK COUNTY, FEDERAL AID PROJECT NO. F6360 (2) JUNE 1948 SCALE 1-50' FILE NO. 16-71; THENCE RUNNING S 89° 58' 00" W ALONG THE NORTHERLY STREET LINE OF ALFRED ROAD FOR A DISTANCE OF 109.23 MORE OR LESS FEET TO A CORNER IN THE SOUTHERLY LINE OF PROPERTY NOW OR FORMERLY BELONGING TO BOSTON AND MAINE RAILROAD;

THENCE RUNNING NORTHEASTERLY BOUNDING NORTHWESTERLY BY PROPERTY NOW OR FORMERLY BELONGING TO BOSTON AND MAINE RAILROAD, CURVING TO THE LEFT ALONG THE ARC OF A CIRCLE HAVING A RADIUS OF 9204.62 FEET, A CENTRAL ANGLE OF 2° 30'

Exit

S = Shower
 V = vanity
 T = toilet
 HC = Handicap



* Plumbing / Electrical is existing.
 * NO structural changes to space
 * same use as before.

legm floor

legm floor

legm floor

Storage Area

Casadio Area

Seating Area

Desk

Hydro massager

Towel

Towel

Hydro massager

Closet

420 Alford Street 5 Areas Storage etc.
 " old playroom Extension Space "

mail

TEXIL 10/1500 sq ft

Letter of intent / bio For:



Biddeford MAINE

orangecircuitfitness.com

To Be Submitted To:
City Of Biddeford

CONTACT:

N: Patrick Welch (owner)

N: Orange Fitness is a SUB S CORP

A: PO BOX 152 SACO MAINE 04072

C: 207-281-3812

E: patrickwelch04072@hotmail.com

Orange Fitness DBA OCF Fitness

Name of business

orange fitness d/b/a Orange Circuit Fitness

Name of officers and ownership %

President: Patrick M Welch	100%
Treasurer Ralph Austin	0%
<i>Maine Sub S Corporation</i>	

Address and phone number of business

PO BOX 152 SACO MAINE
Business Phone (207) 571-4015

"This bio should not be reproduced or distributed to others without explicit permission from the author.

Letter of intent

Landlord:

BVH Biddeford, LLC
2 Livewell Drive, Suite 201
Kennebunk, Maine 04043

Location:

5 Points Shopping Center
420 Alfred Street
Biddeford Me, 04005

Tenant:

Orange Fitness is a SUB S CORP
PO BOX 152 SACO MAINE 04072
207-281-3812
patrickwelch04072@hotmail.com

Request for conditional use permit:

At 420 Alfred street Biddeford Maine 04005 (for new fitness center located in previous Planet Fitness space at the 5 points Shopping Center).

The 10,500 sqft end cap space located at the 5 points mall was originally developed as a Gold's Gym franchise from 1999 to 2004 and converted to a Planet Fitness franchise in 2004 by the applicant (Patrick Welch / Orange Fitness DBA OCF Fitness) both previous fitness center operations were owned / built and operated by Patrick Welch and his entities at the 420 Alfred Street location until 2014 until Welch sold the Planet Fitness business and the new owner / operator relocated the business to the "Old Shaws Building" on Alfred Street.

Applicant (Patrick Welch / orange fitness) intends to operate the new fitness center (orange fitness dba OCF Fitness) in the aforementioned "Old Planet Fitness" space with no changes to any structures, electrical, plumbing. It will be "as is" with the same layout and business use as before (fitness center). Only cosmetic changes / made (ie), paint, floor & wall coverings, signage etc. It was brought to our attention the original conditional use permit expired when Planet Fitness relocated to the "Old Shaws Building" on Alfred street.

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Business Description	2
Operations & Location	3
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Market / Industry Analysis	5
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Executive Summary

Everyone is aware of the increasing demand for health and fitness. A recent Gallup poll indicated that 50% of all Americans and 70% of all college educated Americans participate in some form of exercise.

The trend with clubs who want to successfully cater to this demand is to offer “super” fitness clubs with strong management. They also are operated utilizing proven systems, practices, marketing and sales with well equipped and up to date facilities. (OCF) model is ideal for the Biddeford Maine market. Based on past experience in the Biddeford market, the clubs had good penetration in the area by providing the best fitness facilities and offering to the marketplace with a high value club at competitive prices and that will again be the same approach.

OCF has another asset. Founder, Patrick Welch is the owner, operator and entrepreneur. A lifelong local business person and a 27 year veteran of the fitness industry. Owning operated nearly a dozen different gyms, fitness centers and brands over that span, spending significant time as a franchisee with national chains: Gold’s Gym, Planet Fitness, as well as various independent brands

Patrick is also a contractor and his team has built, expanded, and modified a ½ dozen various locations over the years. Patrick has vast experience in business (fitness, construction, and has assisted other family members with start up, operation and build outs of business in the childcare industry). Patrick has been in the fitness industry and has operated models in both price sectors (low price models and high volume to higher priced with more amenities and member catering services such as Spin, group x, Personal Training, group training etc).

In short Patrick has the ability to design, build, operate and fully develop the business model that best suits the current market place he is in. In his role as company founder Patrick has physically designed, built and adapted to the landscape around his business for decades. As franchisee Patrick had multiple mentors (Franchisors as well as independent experiences for nearly 3 decades) and has experienced every phase of the club experience from start to finish more than a ½ dozen times and is well connected and versed in the industry. From brand new club builds with full presales under multiple franchise models to selling gyms to others and acquisitions with and rebrands / debrands to various models. It is an extensive background in all things fitness clubs / gyms. To note: OCF is a well branded business model. His experience and passion remains fitness center centric with skills around it to support and continue its growth, development which have aided him in his business accomplishments and lessons throughout his career.

To summarize, based on decades of experience we believe the plan for Biddeford Maine will be a great success . Included are marketing examples.

BUSINESS DESCRIPTION



[PERSONAL TRAINING](#) [GROUP X SCHEDULE](#)

[HOME](#) [JOIN NOW](#) [PHILOSOPHY](#) [CAREERS](#) [CONTACT](#) [MEMBER LOGIN](#)



MYZONE
IS HERE, GET STARTED TODAY!

[JOIN NOW](#)

GET 1 FREE PERSONAL TRAINING SESSION WHEN YOU JOIN IN AUGUST!

020 : 23 : 33 : 40
Dance Fitness Pilates Cardio

\$1 ENROLLMENT

BLU PASS INCLUDES: OCF GROUP X, HITT, TANNING, FAMILY AND MORE!

- OCF BLU PASS / \$1 ENROLLMENT
- PERSONAL TRAINING / 1 SESSION (NOT INCLUDED IN BLU PASS)
- PERSONAL TRAINER / 1 SESSION
- KETOSOL
- TANNING / 1 SESSION (NOT INCLUDED IN BLU PASS)
- PERSONAL TRAINER / 1 SESSION (NOT INCLUDED IN BLU PASS)

4.

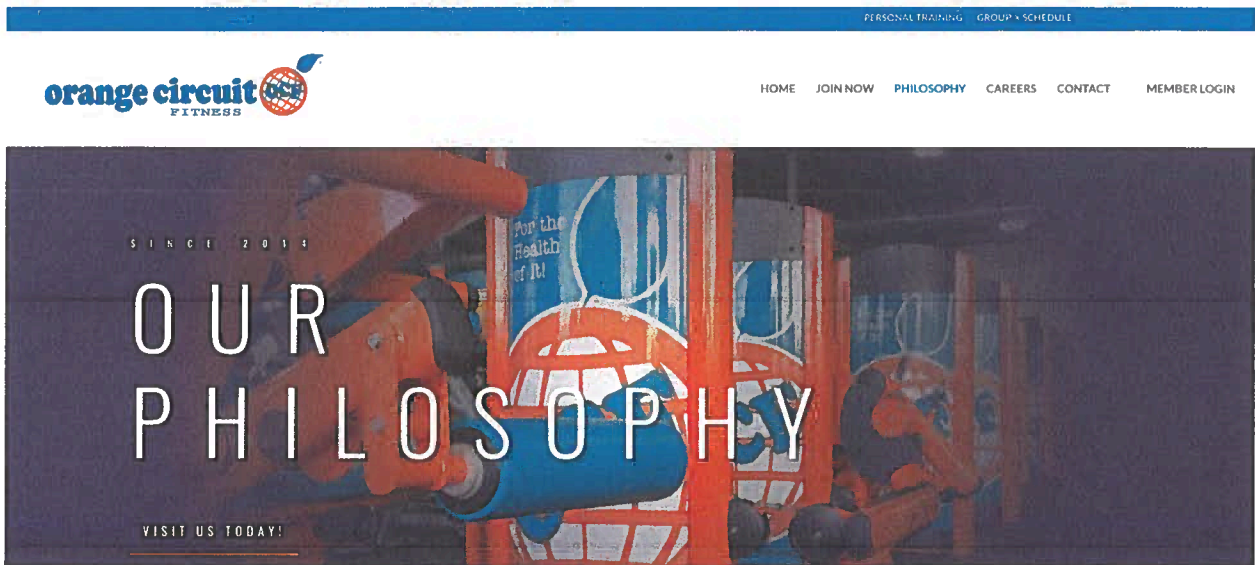
The following is the Biddeford facility details:

1. A 10,500 sqft² location.
2. The facility has been designed in such a way that all areas interact with one another creating an exciting and energetic environment.
3. This facility features a cardiovascular deck with an elevated deck that allows people using the cardiovascular equipment to view all exercises, watch TVs, and observe the full exercise floor for a less intimidating environment for beginners.
4. Tanning: The facility features 2 tanning beds
5. Hydro Massage: 1 Hydro Massage bed
6. Muscular conditioning and / Training: These areas have a wide variety in quality of exercise machines
7. Supplements, cooler drinks, Pro Shop items, Clothing Etc.
Fitness Training Programs

OPERATION & LOCATION

- a. OCF Biddeford plans to operate 24 hrs a day 7 days a week.
- b. 420 Alfred Street (5 Points Shopping Center Biddeford Maine 04005.

PRODUCTS & SERVICES



FOR THE HEALTH OF IT™

At orange circuit fitness® we strive to maintain an atmosphere that is inviting, clean, friendly, dynamic and healthy! We encourage all fitness levels to be part of the OCF family and our mission is to help you, our valued member, by providing you with resources and support toward achieving and sustaining your health and wellness goals. At orange circuit fitness® we are here for you! For the health of it™!

OCF primarily offers the traditional fitness center experience (No basketball, swimming pools etc) with its own unique style, fit up, decor and brand. Atmosphere and knowledgeable staff, facility (tools) we provide our customers is best in class. OCF pricing is affordable and has lots of features to trade up in value.

The screenshot shows the Orange Circuit Fitness website with a blue header containing navigation links: HOME, JOIN NOW, PHILOSOPHY, CAREERS, CONTACT, and MEMBER LOGIN. The main content area features three membership cards:

- White Pass™**: "Everybody & Every Body Type™", \$25/Biweekly. Benefits include: Unlimited Use Of Home Gym, Unlimited Equipment Orientation, 50 - 70 pieces of cardio equipment (locations may vary), Strength equipment, Free weights, dumbbells, squat racks, flat benches, and more!, Locker rooms with showers, and Fully equipped functional and stretch areas.
- Orange Pass™**: "The Body Positive Gym™", \$30/Biweekly. Benefits include: Unlimited guest privileges (home club only), Use of tanning booths and beds, Reciprocal use of all orange circuit fitness @ locations, Fit 3D Body Scan (participating locations), Unlimited use of hydro massage beds, and Virtual group X studio™ (participating locations).
- Blu Pass™**: "For The Health Of It™", \$35/Biweekly. Benefits include: No commitment membership, No annual fee membership, Add 1 additional family member (with OCF blu pass™ benefits), Unlimited guest privileges (all locations), Use of tanning booths and beds, OCF Group X Program w/ yoga, and Reciprocal use of all orange circuit fitness @ locations.

9.

OCF BLU PASS ALL THIS AND MORE!

The graphic lists the following benefits of the OCF Blu Pass:

- FAMILY ADD ON**: Represented by an icon of two people.
- NO CONTRACT**: Represented by a circular seal with "NO CONTRACT" repeated three times.
- NO COMMITMENT**: Represented by the text "NO COMMITMENT" in red.
- ONLINE ACCESS**: Represented by the "FITNESS ON DEMAND" logo and the text "ONLINE ACCESS".
- TANNING**: Represented by a sun icon and the text "TANNING".
- myzone**: Represented by the "myzone" logo.
- NO ANNUAL FEE**: Represented by a red stamp with the text "NO ANNUAL FEE".

8.

Market / Industry

1. Who the market is (see attached marketing analysis MOTO / IHRSA).
2. The size of the market (see attached).
3. Orange Circuit Fitness" percentage of the market (see attached).
4. The market's growth potential (see attached "MOTO" Feasibility).

- Services:
- Cardiovascular Theater – Cardio theater in the main room with treadmills, stationary bikes, ellipticals, stair climbers, etc. The area features televisions accessible via a personal my-system; hence, the name "Theater".
- Tanning Facilities – Tanning booth & beds, standard for the industry, are provided. The location of the tanning booth and beds are across from the front desk to attract tanners only" to the facility and privacy for those who do not come to exercise.
- OCF Express Functional training zone – Turf area for core and circuit workout of strength exercises located on the recently expanded part of the facility. .
- Muscular Condition/Training – This area consists of free weights and the latest in strength training equipment. It is a vast array of equipment in a well situated space for members to access easily and comfortably.
- Fitness Training – This service is not included in memberships. A program to aid members in achieving their goals in a safe and consistent manner. Fitness Training is a valuable retention tool as well as a profit center).

WHERE AND HOW OFTEN AMERICANS CHOOSE TO WORKOUT

Heading into 2020, health club membership and usage trends indicated sustainable growth over the long-term. While recovery from the current downturn will be daunting, the health club industry has shown resilience when faced with previous challenges. This data shows the strength of the industry at the beginning of 2020.

TOP 6 FACILITY TYPES



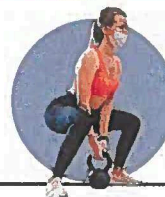
PENETRATION RATE INCREASE 2010 - 2019

The increasing penetration rates over the last 10 years speaks to the significant role fitness facilities play in promoting health and physical activity.



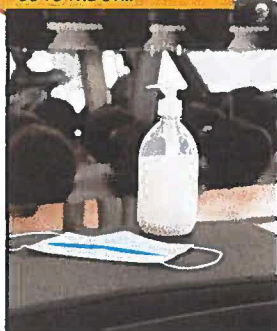
WHY AMERICANS EXERCISE AT GYMS

Gym goers have diverse goals that fitness centers help them achieve. The latest research shows why Americans belong—and will continue to belong—to gyms.



70% of people say maintaining overall health is why they'll return to their gym in some capacity

4 MAIN REASONS PEOPLE GO TO THE GYM



SOLVE A PROBLEM

More than **one out of four members** indicate using a gym or health club to address a specific health concern.

ENHANCE THEIR WELL-BEING

Nearly **half of gym goers** (49%) use their club to improve their mood and reduce stress.

FUEL A PASSION

Sport-specific conditioning rank high among members' goals.



IT'S THEIR COMMUNITY

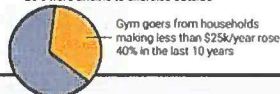
The social aspects of a club rank highly among members.

42% miss working out with other people

36% miss their gym's sense of community

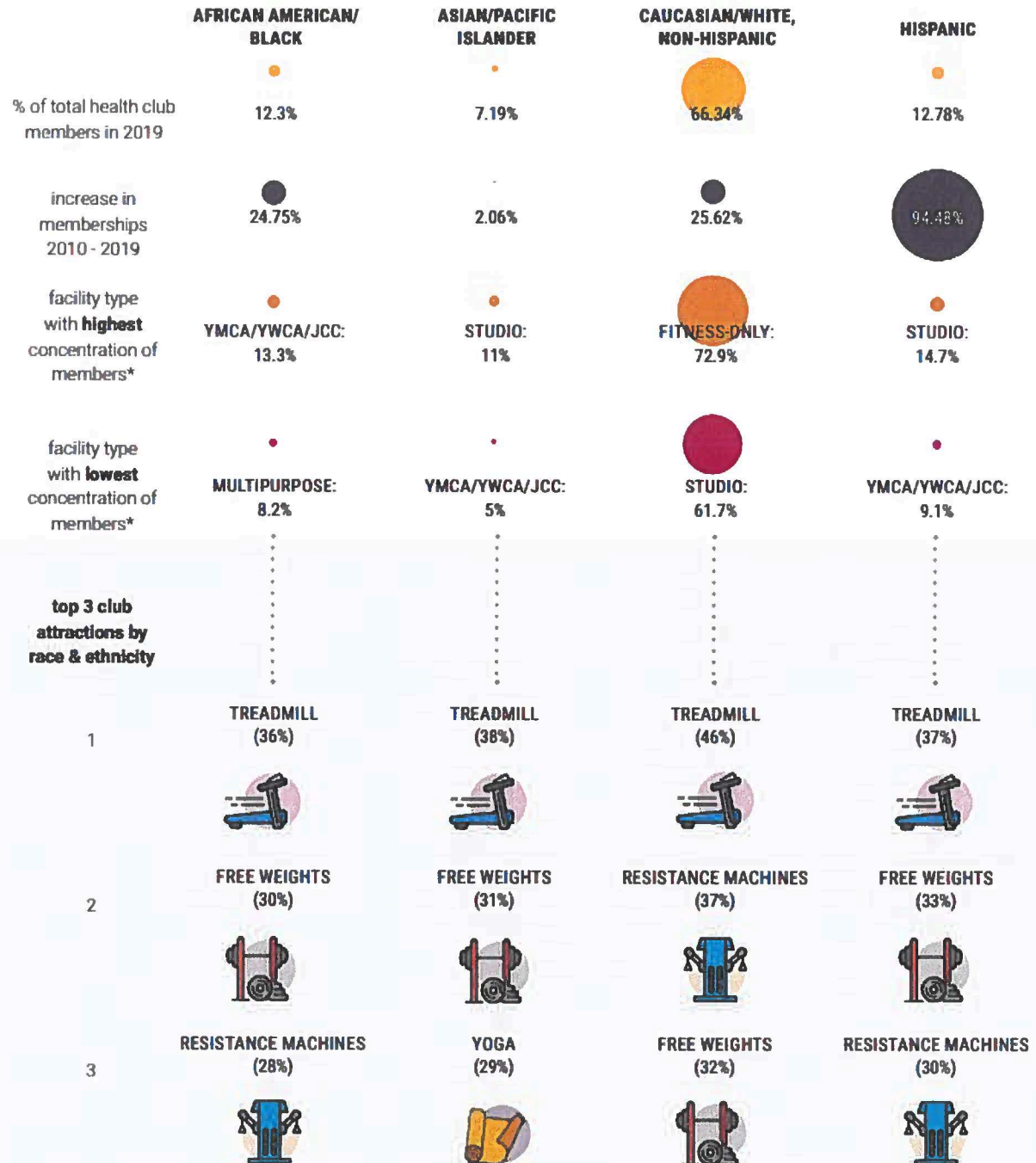
For consumers with a lower annual household income, health clubs and gyms may be their only outlet for exercise.

Of Californians making less than \$75k/year, **43%** reported having no where to exercise at home & **26%** were unable to exercise outside



MEMBERS BY RACE & ETHNICITY

*Due to the low base for minority group categories, a three-year average was used in analysis.

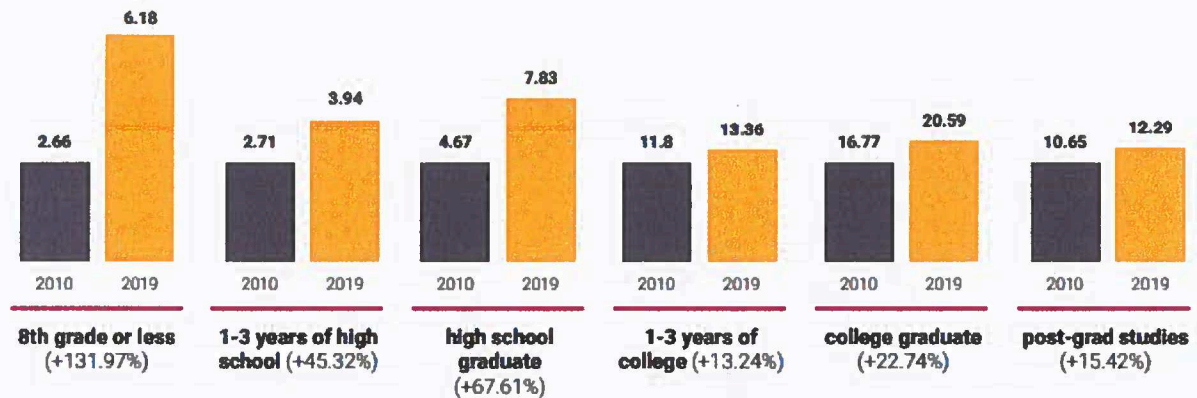


MEMBERS BY EDUCATION & HOUSEHOLD INCOME

EDUCATION

Over the past decade, members with the least amount of formal education grew at the fastest rate across educational brackets. This trend may be because clubs have been attracting younger children and adults in recent years.

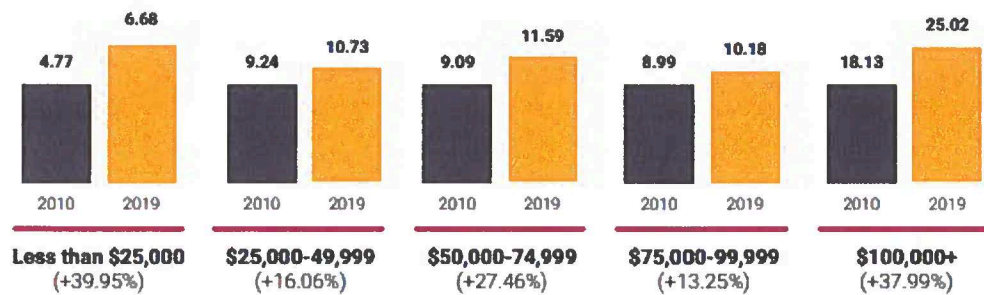
HEALTH CLUB MEMBER GROWTH BY EDUCATION (in millions)



HOUSEHOLD INCOME

Historically, consumers from higher income households are more likely than consumers from lower income households to be health club members. However, the lowest income bracket posted the greatest growth from 2010 to 2019.

HEALTH CLUB MEMBER GROWTH BY INCOME (in millions)



MEMBERS BY AGE

U.S. HEALTH CLUB MEMBERS (in millions)

members ages
6 - 17
(increased 69.81%)



members ages
18 - 34
(increased 23.8%)



members ages
35 - 54
(increased 11.55%)



members ages
55 - 64
(increased 42.48%)



members ages
65+
(increased 34.16%)



TOP 3 CLUB ATTRACTIONS FOR EACH AGE GROUP



treadmills



step/climber/stepped exercise



free weights



treadmills



free weights



resistance machines



treadmills



resistance machines



free weights



treadmills



resistance machines



stationary bike



treadmills



resistance machines



stationary bike



GEN Z
UNDER 20
(born 2000 and later)

16% of total U.S. health club members

YMCA/YWCA/JCC: facility type with highest concentration at 25%

fitness-only: facility type with lowest concentration at 10%

55% want to be more physically active



MILLENNIALS
21 - 40
(born 1980 - 1999)

35% of total U.S. health club members

corporate/business: facility type with highest concentration at 48%

YMCA/YWCA/JCC: club type with lowest concentration at 31%

45% want to be more physically active



GEN X
41 - 55
(born 1965 - 1979)

22% of total U.S. health club members

fitness-only: facility type with highest concentration at 28%

other nonprofit: club type with lowest concentration at 18%

53% want to be more physically active



BOOMERS
56 - 75
(born 1945 - 1964)

21% of total U.S. health club members

fitness-only: facility type with highest concentration at 25%

studios: facility type with lowest concentration at 8%

69% want to be more physically active



SILENT
OVER 76
(born 1928 - 1944)

6% of total U.S. health club members

other nonprofit: facility type with highest concentration at 7%

studios: facility type with lowest concentration at 2%

WHO IS GOING TO HEALTH CLUBS

MEMBERS BY GENDER

male
members
increased
23.2%
between
2010 & 2019

\$54/month
average paid
for membership
dues

more likely to pay for premium
access 65% of members that paid
more than \$200 monthly were men

5 years average length of
membership, about four months
longer than the overall average

106 visits a year to health and
fitness facilities on average

favors **multipurpose clubs** and
sports-specific studios

men tend to prefer **strength
equipment**

more likely to participate in **athletic
activities** at health clubs

51% of men aim to increase their
physical activity

female
members
increased
32.2%
between
2010 & 2019

\$50/month
average paid
for membership
dues

more likely to pay less for access
over half of members paying less
than \$100 monthly were women

4.4 years average length of
membership, about four months
shorter than the overall average

102 visits a year to health
and fitness facilities on average

more likely to belong to a
yoga, Pilates, or barre studios

women tend to prefer **cardio
equipment**

more likely to engage in **group-
based activities** at health clubs

65% of women aim to increase
their physical activity



*The annual fitness and sports participation study demographic groups are based on the U.S. Census questionnaire. To date, analysis by non-binary gender groups is not available yet, but may be in the future.



CONTACT IHRSA:
70 FARGO STREET,
BOSTON, MA 02210
800-228-4772
+1 617-951-0055
INFO@IHRSA.ORG



Marketing Strategy Target

- 1) See attached IHRSA material and below as to target and facility type.
OCF is a fitness facility of the largest driver in the fitness space)
- 2) middle to upper income 13-75 year olds.

(Example of direct Mail piece)



(Example of the OCF Holiday Mailer)



The time is here
to spread
OCF Cheer!

Our way of saying thank you...
For the Health of It™!

 10% OFF PRO SHOP Best prices on supplements, fitness gear and more. Expires 12/31/11.	 \$399 12 Month Best personal training, group personal training, and more. Expires 12/31/11.	 1 FREE Guest Pass Best personal training, group personal training, and more. Expires 12/31/11.
 \$19 Upgrade to the Blue Pass Best personal training, group personal training, and more. Expires 12/31/11.	 \$299 Per Year! Best personal training, group personal training, and more. Expires 12/31/11.	 1 Month FREE! Tanning Best personal training, group personal training, and more. Expires 12/31/11.

www.orangecircuitfitness.com

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18.



[Click Here To Visit Our Website](#)



19.

WHERE AND HOW OFTEN AMERICANS CHOOSE TO WORKOUT

Heading into 2020, health club membership and usage trends indicated sustainable growth over the long-term. While recovery from the current downturn will be daunting, the health club industry has shown resilience when faced with previous challenges. This data shows the strength of the industry at the beginning of 2020.

TOP 6 FACILITY TYPES



19.1 M
fitness-only



12.9 M
multipurpose



11.8 M
YMCA/YWCA/JCC



7.47 M
personal/small
group training



5.66 M
yoga, pilates,
or barre



4.66 M
indoor cycling
or rowing

*other segment types: 27.45 M



PENETRATION RATE INCREASE 2010 - 2019

The increasing penetration rates over the last 10 years speaks to the significant role fitness facilities play in promoting health and physical activity.

+3.5%
health club members
(from 17.7% to 21.2%)

+3.8%
total gym-goers
(from 20.5% to 24.3%)

multipurpose

Management

Management Patrick Welch is the owner of OCF. Parick has been involved in the fitness industry for over 27 years. In 1996, Patrick purchased his first gym. It was a small independent 5,000 sq ft gym in Saco Maine that he began working at in 1992. Since that time Patrick bought, sold, built, rebranded 10+ gyms / fitness centers in his career including opening Southern Maine's first fitness franchise in Biddeford Maine (Gold's Gym), and becoming the (4th franchisee) in the Planet Fitness chain as well as independent OCF brands. Patrick has a vast amount of experience in the fitness space, he is also a general contractor (he and his team have built and remodeled many of the gyms aforementioned). Patricks time in and out of many franchise models provides a unique perspective to all areas of the fitness business. Marketing, branding, operations, human resources, administrative etc,. He has a seasoned team working with him. He has a lot of expertise to draw on throughout his career. He has adapted in every market he has had a business and with varying models and services.

Patrick started working in a gym when he was 19 -20 years old and has worked in every capacity and role of the business at one time or another. Admin, scheduling, and marketing to the CEO / president of his companies over the years. Patrick's parents were also life long self employed small business owners from which he had early mentorship and partnerships to get his career started.

Brand / Trademarks

OCF, Orange Circuit Fitness (both word and designs) are all registered trademarks with the USPTO office.

United States of America

United States Patent and Trademark Office



Reg. No. 4,887,733

Registered Jan. 19, 2016

Int. Cl.: 41

SERVICE MARK

PRINCIPAL REGISTER

ORANGE FITNESS (MAINE CORPORATION)
109 KING STREET
SACO, ME 04072

FOR: PROVIDING HEALTH AND FITNESS CLUB EXERCISE FACILITIES, IN CLASS 41
(U.S. CLS. 100, 101 AND 107).

FIRST USE: 10-15-2014; IN COMMERCE 10-15-2014.

THE MARK CONSISTS OF A WHITE CIRCLE OUTLINED IN ORANGE WITH INTERSECTING ORANGE LINES WITHIN WHICH ARE THE GREEN LETTERS "OCF" AND ATTACHED TO THE TOP OF THE CIRCLE IS A GREEN LEAF DESIGN.

THE COLOR(S) GREEN, ORANGE, AND WHITE IS/ARE CLAIMED AS A FEATURE OF THE MARK.

SER. NO. 86-425,239, FILED 10-16-2014.

CHRISTOPHER BUONGIORNO, EXAMINING ATTORNEY



Michelle K. Lee

Director of the United States
Patent and Trademark Office

United States of America

United States Patent and Trademark Office



Reg. No. 4,916,741

ORANGE FITNESS (MAINE CORPORATION)
109 KING STREET
SACO, ME 04072

Registered Mar. 15, 2016

Int. Cl.: 41

FOR: PROVIDING HEALTH AND FITNESS CLUB EXERCISE FACILITIES, IN CLASS 41
(U.S. CLS. 100, 101 AND 107).

SERVICE MARK

FIRST USE 10-15-2014; IN COMMERCE 10-15-2014.

PRINCIPAL REGISTER

NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "CIRCUIT" OR "FITNESS",
APART FROM THE MARK AS SHOWN.

THE COLOR(S) GREEN, ORANGE AND WHITE IS/ARE CLAIMED AS A FEATURE OF THE
MARK.

THE MARK CONSISTS OF A WHITE CIRCLE OUTLINED IN ORANGE WITH INTERSECT-
ING ORANGE LINES WITHIN WHICH ARE THE GREEN LETTERS "OCF" AND ATTACHED
TO THE TOP OF THE CIRCLE IS A GREEN LEAF DESIGN; TO THE RIGHT OF THE DESIGN
APPEARS THE STYLIZED TERMS "ORANGE CIRCUIT FITNESS"; THE TERMS "ORANGE"
AND "FITNESS" ARE IN THE COLOR ORANGE AND THE TERM "CIRCUIT" IS IN GREEN.

SER. NO. 86-425,236, FILED 10-16-2014.

CHRISTOPHER BUONGIORNO, EXAMINING ATTORNEY



Nichelle K. Lee

Director of the United States
Patent and Trademark Office

United States of America

United States Patent and Trademark Office

ORANGE CIRCUIT FITNESS

Reg. No. 4,916,740

Registered Mar. 15, 2016

Int. Cl.: 41

SERVICE MARK

PRINCIPAL REGISTER

ORANGE FITNESS (MAINE CORPORATION)
109 KING STREET
SACO, ME 04072

FOR: PROVIDING HEALTH AND FITNESS CLUB EXERCISE FACILITIES, IN CLASS 41
(U.S. CLS. 100, 101 AND 107).

FIRST USE 10-15-2014; IN COMMERCE 10-15-2014.

THE MARK CONSISTS OF STANDARD CHARACTERS WITHOUT CLAIM TO ANY PARTICULAR FONT, STYLE, SIZE, OR COLOR.

NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "CIRCUIT" OR "FITNESS",
APART FROM THE MARK AS SHOWN.

SER. NO. 86-425,235, FILED 10-16-2014.

CHRISTOPHER BUONGIORNO, EXAMINING ATTORNEY



Michelle K. Lee

Director of the United States
Patent and Trademark Office

FIVE POINTS SHOPPING CENTER - ROUTE 111, BIDDEFORD, MAINE

LEASE AGREEMENT FOR ORANGE FITNESS

THIS LEASE AGREEMENT is made this 25th day of May 2023, by and between BVH Biddeford, LLC, having its principal place of business at 2 Livewell Drive, Suite 201, Kennebunk, Maine 04043 ("Landlord") and Orange Fitness, a Maine corporation with a mailing address of PO Box 152, Saco, Maine 04072 ("Tenant").

ARTICLE I

CERTAIN LEASE PROVISIONS

1.1 Certain Definitions. As used herein, the following terms shall have the meaning herein specified.

(a) Demised Premises. Unit 1 on Exhibit A attached hereto, as more fully set forth in Article II hereof, which shall be deemed to contain 10,600 square feet of Gross Leasable Area.

(b) (i) Term: as more fully set forth in Article III hereof: a period of five (5) years from the Rent Commencement Date.

(ii) Commencement Date: July 9, 2023.

(iii) Rent Commencement Date: October 1, 2023, for Tenant's share of Common Costs; January 1, 2024 for rent.

(iv) Termination Date: June 30, 2028.

(v) Extended Term, as more fully set forth in Article III hereof: One Extended Term of Five (5) years.

(c) Fixed Minimum Rent, as more fully set forth in Article IV hereof:

Lease Base Rent Schedule:

	Lease Dates	S/S. F.	Mo. Rent	Annual Rent
Yr. 1:	7/01/23 - 6/30/24	@ \$10.00	\$8,750.00	\$105,000.00
Yr. 2:	7/01/24 - 6/30/25	@ \$10.00	\$8,750.00	\$105,000.00
Yr. 3:	7/01/25 - 6/30/26	@ \$13.00	\$11,375.00	\$136,500.00
Yr. 4:	7/01/26 - 6/30/27	@ \$13.00	\$11,375.00	\$136,500.00
Yr. 5:	7/01/27 - 6/30/28	@ \$13.00	\$11,375.00	\$136,500.00

Renewal Option Rent Schedule:

	Lease Dates	S/S. F.	Mo. Rent	Annual Rent
Yr. 6:	7/01/28 - 6/30/29	\$14.00	\$12,250.00	\$147,000.00
Yr. 7:	7/01/29 - 6/30/30	\$14.00	\$12,250.00	\$147,000.00
Yr. 8:	7/01/30 - 6/30/31	\$14.00	\$12,250.00	\$147,000.00
Yr. 9:	7/01/31 - 6/30/32	\$14.00	\$12,250.00	\$147,000.00
Yr. 10:	7/01/32 - 6/30/33	\$14.00	\$12,250.00	\$147,000.00

(d) (i) Permitted Use, as more fully set forth in Article VI hereof: Fitness Center.

(ii) Tenant's Business Name: "Orange Fitness".

ARTICLE IV

RENT

4.1 General. The rental reserved to Landlord during the Term, which Tenant covenants and agrees to pay to Landlord as herein provided, without prior demand and without any deduction or setoff whatsoever, shall consist of a fixed minimum rent and additional rent (herein referred to as the "Fixed Minimum Rent" and the "Additional Rent", and collectively the "Rent"). All Rent and other payments required to be made by Tenant to Landlord under this lease shall be paid to Landlord at Landlord's address set forth in paragraph (g) of Article I, or at such other place as Landlord may from time to time direct by notice to Tenant.

4.2 Fixed Minimum Rent. The Fixed Minimum Rent shall be payable by Tenant to Landlord annually in twelve (12) equal monthly installments in advance on the first day of each month during each Lease Fiscal Year (as defined in Article XVII) without offset or deduction commencing on the Rent Commencement Date as set forth in Section 1.1(b)(iii). If the Rent Commencement Date is other than the first day of a calendar month, then the Fixed Minimum Rent for such fractional month shall be calculated proportionately on the basis of a thirty (30) day month.

4.3. If any payment of Fixed Minimum Rent is not received by Landlord within five (5) days of the specified due date, Landlord may charge a "late fee" of \$100.00 plus interest at the rate of twelve (12%) percent per annum for the entire period the payment is past due. Said late fee and interest shall be considered Additional Rent and shall be deemed earned, due and payable prior to application of any balance received to any amounts outstanding. The assessment and collection of a late fee shall in no way release Tenant from its obligations of future payments or diminish Landlord's rights under this Lease.

4.4 Additional Rent. All sums required to be paid by Tenant pursuant to the provisions of this lease, other than the Fixed Minimum Rent, shall be as Additional Rent.

ARTICLE V

CONSTRUCTION

5.1 Landlord's Work; Tenant's Work. The Demised Premises are being conveyed to Tenant in their "as is" condition.

All construction and/or installation of personal property, trade fixtures, equipment, and other leasehold improvements desired by Tenant to make the Demised Premises ready for the operation of Tenant's business (collectively the "Tenant's Work") shall require prior approval by the Landlord, which approval will not be unreasonably withheld. All Tenant's Work shall be promptly performed by Tenant and done in a good and workmanlike manner, at Tenant's sole cost and expense using new materials of good quality in accordance with plans previously approved by Landlord. Tenant agrees to apply for and obtain all local and state permits required in connection with such work. All such work shall be completed in compliance with applicable laws, building codes, ordinances and regulation of the governmental authorities have jurisdiction thereof. Tenant shall comply with all state and local disability laws, rules and regulations.

5.2 Mechanic's Liens. Tenant shall do all things reasonably necessary to prevent the filing of mechanics' or other liens or encumbrances against the Shopping Center by reason of work, labor, services or materials supplied or claimed to have been supplied to Tenant by any entity other than Landlord. If any such lien or encumbrance shall be filed against the Shopping Center, or any portion thereof, Tenant shall cause same to be discharged of record, or bonded to the satisfaction of Landlord, within ten (10) days after the date of filing same. In connection with the foregoing Tenant shall indemnify and save harmless Landlord and all mortgagees from all costs, liabilities, claims and demands, including reasonable attorney's fees resulting therefrom. If Tenant shall fail to discharge or bond any such lien or encumbrance within such period then, in addition to any other right or remedy, Landlord may discharge the same and Tenant agrees to reimburse Landlord promptly upon demand for all costs and expenses in connection therewith, including attorney's fees, (as Additional Rent) with interest at twelve percent (12%) per annum.

5.3 Access to Demised Premises. Any access or possession by Tenant prior to the Commencement Date shall be on and subject to all the other terms, provisions, covenants, and conditions of this lease, except for the payment of Rent.

ARTICLE VI USE AND OPERATION

6.1 Use. Tenant shall use the Demised Premises solely for the Permitted Use set forth in Section I (d) and for no other purpose. Tenant shall have the exclusive right to operate a fitness center in the Shopping Center.

Tenant agrees not to violate any exclusive use provisions in any other leases in the Shopping Center.

6.2 Hours of Business. Tenant agrees that it will keep its place of business in the Shopping Center open continuously during the term of this lease, up to 24 hours per day, seven days per week, and will not cease operations in the Demised Premises without the express written consent of the Landlord, unless prevented from doing business therein by reason of applicable ordinances or other acts of governmental authorities, or by acts of God.

ARTICLE VII INDEMNITY AND INSURANCE

7.1 Indemnity. Tenant agrees to indemnify, defend and save harmless Landlord, and any person or person in privity of estate or contract with Landlord with respect to the Shopping Center, from and against any and all claims and demands of third persons (including, but not limited to those for death, personal injuries, or for loss or damage to property) occurring in or arising directly or indirectly out of, or in connection with the use and occupancy of the Demised Premises, the business conducted in the Demised Premises, or (without limiting the foregoing) as a result of any acts, omissions, or negligence of Tenant or any contractor, licensee, invitee, agent, employee, or other person under the control of Tenant in or about the Demised Premises or the Shopping Center, from and against all costs, expenses and liability occurring in or in connection with any such claim or proceeding brought thereon.

7.2 Insurance. (a) From and after the date the Demised Premises are made available to Tenant for commencement of Tenant's Work until the end of the Term, Tenant agrees to maintain in full force, at its own expense, one or more policies of comprehensive general liability and property damage insurance insuring against liability for injury to persons and/or property (and death) of any person or persons in or about the Demised Premises. The limits of liability of such insurance shall be not less than a combined single limit of One Million Dollars (\$1,000,000) for injury or death to one person, Two Million Dollars (\$2,000,000) arising from any one occurrence, and not less than Two Hundred Fifty Thousand Dollars (\$250,000) with respect to damage to property. In no event shall the limits of said policies be considered as limiting the liability of Tenant under this lease. Tenant shall require all contractors it hires to perform work on the Demised Premises to carry no less than One Million Dollars (\$1,000,000) in comprehensive general liability coverage and Two Hundred Fifty Thousand Dollars (\$250,000) for property damage.

(b) Tenant agrees to maintain in full force, during the Term, at its own expense one or more policies of fire and extended coverage, vandalism, malicious mischief and sprinkler leakage insurance with "All Risks" endorsement, covering its fixtures and equipment located on the Demised Premises, such insurance to be in an amount equal to at least 100% of the replacement value thereof. The proceeds of such insurance, so long as this lease remains in effect, shall be used to repair and/or replace the fixtures and other equipment so insured.

(c) Tenant agrees to maintain in full force, during the Term, at its own expense one or more policies of workmen's compensation insurance providing statutory coverage and containing statutory limits. Tenant shall obtain certificates of such insurance from all contractors performing any of Tenant's Work under Section 5.1.

(d) All insurance required to be carried by Tenant hereunder shall insure Tenant and Landlord, and such other person or persons designated by Landlord that have an insurable interest in the Demised Premises, including the holder of any mortgage affecting the Demised Premises, shall be named as additional insureds.

7.3 Failure to Maintain Insurance: Blanket Insurance. A certificate of insurance evidencing that Tenant is in compliance with its obligations under this lease shall be delivered to Landlord at least thirty (30) days prior to the time such insurance is first required to be carried by Tenant, and thereafter at least thirty (30) days prior to the expiration of any such policy. In the event of Tenant's failure, in whole or in part, to obtain insurance required under this lease, or to provide evidence thereof in a timely fashion, Landlord shall have the right (but not the obligation) to procure such insurance and Tenant shall pay to Landlord the costs and expenses thereof as Additional Rent. Any insurance required to be provided by Tenant under Section 7.2 may be provided by blanket insurance covering both the Demised Premises and other locations of the Tenant if such blanket insurance complies with all of the other requirements of this lease and provided that such blanket insurance is acceptable to any mortgagee for the Shopping Center.

7.4 Release of Liability. Tenant agrees to use and occupy the Demised Premises and to use all other portions of the Shopping Center which it is permitted to use by the terms of this lease, at its own risk and hereby (for itself and all persons claiming under, by or through Tenant) releases Landlord, its agents, servants, contractors and employees from all claims and demands of every kind resulting from any accident, damage or injury occurring therein, except those claims arising from the wrongful or negligent acts of Landlord, its servants, agents, contractors, or employees. Landlord shall have no responsibility or liability for any loss, damage or injury to fixtures, improvements or other personal property of Tenant, except those claims arising from the wrongful acts of Landlord, its servants, agents, contractors, or employees.

Notwithstanding anything to the contrary provided in this lease, it is specifically understood and agreed that there shall be absolutely no personal liability on the part of any mortgagee or landlord, nor any officer, director, stockholder, trustee, beneficiary or partner of such mortgagee or landlord, with respect to any of the terms covenants and conditions of this lease, and that Tenant shall look solely to the equity of the Landlord, or any successor in interest in the Demised Premises, for the satisfaction of each and every remedy of Tenant in the event of any breach by Landlord, or by any successor in interest, of any of the terms, covenants and conditions of this lease to be performed by Landlord.

Landlord shall not be responsible or liable to Tenant for any loss or damage that may be occasioned by the acts or omissions of persons occupying any space adjacent to or adjoining the Demised Premises or any part thereof, or for any loss or damage resulting to Tenant or its property from water, gas, steam, fire, or the bursting, stoppage or leaking of sewer or water pipes.

7.5 Fire Regulations, etc. Tenant agrees, at its own cost and expense, to comply with all of the rules and regulations of the Fire Insurance Rating Organization having jurisdiction, or any similar body having jurisdiction, over the Demised Premises. If Tenant installs any electrical equipment that overloads the lines in the Demised Premises, or the building in which the Demised Premises are located, Tenant shall, at its own cost and expense, promptly make whatever changes are necessary to remedy such condition and comply with all requirements of the Landlord and any governmental authority having jurisdiction thereof.

7.6 Flammable Materials. If this lease so permits, and Tenant engages in the preparation of food or packaged foods or engages in the use, sale or storage of flammable or combustible materials, Tenant shall install in the Demised Premises chemical fire extinguishers, and shall keep and maintain such devices in good working condition during the entire Term of this lease.

7.7 Fire Insurance. Landlord covenants and agrees to maintain throughout the Term fire and standard extended coverage insurance, that shall include the Demised Premises, in an amount not less than that required for replacement of the building comprising the Shopping Center. The premiums for such insurance, plus any deductible costs not reimbursed under a claim, shall be part of the Common Costs shared by Tenant in accordance with the provisions of Section 16.1 thereof.

ARTICLE VIII

FIRE AND OTHER CASUALTIES

8.1 Repairs. If the Demised Premises should be damaged during the Term by fire or any other casualty, Landlord shall (except as hereinafter provided) repair the same, provided that Tenant is not then in default of this lease.

8.2 Option to Cancel. If (a) the Demised Premises, or the building comprising the Shopping Center, should be damaged or destroyed (i) by fire or other casualty (i) to the extent of 25% or more of the cost of replacement of either thereof, or (ii) so that 25% or more of the Gross Leasable Area contained in either shall be rendered untenable, or (2) by any casualty other than those covered by standard fire and extended coverage insurance policies; or (b) if Landlord's mortgagee shall require that any portion of the insurance proceeds resulting from such damage or destruction be applied against any obligation due to such mortgagee, then Landlord may, at its option, either terminate this lease or elect to repair the Demised Premises. Landlord shall notify Tenant as to its election within 120 days after such fire or other casualty. If Landlord elects to terminate this lease, then the Term hereof shall end at the end of the calendar month in which such election is made. If Landlord does not elect to terminate this lease, then Landlord shall perform such repairs and rebuilding as set forth in Section 8. hereof, Tenant shall perform such repairs and rebuilding as are set forth in Section 8.4 hereof, the Term shall continue without interruption, and this lease shall remain in full force and effect.

8.3 Reconstruction by Landlord. If Landlord does not elect to terminate this lease as provided in Section 8.2, Landlord shall reconstruct the building of which the Demised Premises forms a part, and so much of the Demised Premises as Landlord was required to furnish in accordance with the plans and specifications approved by Landlord in accordance with Article V. All work to be performed by Landlord shall be done in such manner that, upon completion, that portion of the Demised Premises repaired or rebuilt shall contain substantially the same amount of Gross Leasable Area as immediately prior to the damage or destruction. In the event that such reconstruction of the Demised Premises shall not be substantially complete within three months from the date of such casualty, Tenant may elect to terminate this Lease by 30 days written notice to Landlord, provided that said election shall be void and of no force and effect if the reconstruction of the Demised Premises shall be substantially completed within said 30 day period.

8.4 Repairs by Tenant. If Landlord does not elect to terminate this lease as provided in Section 8.2, Tenant shall, at its own cost and expense, repair and restore the Demised Premises in accordance with the provisions of Article V to the extent not required to be repaired by Landlord pursuant to the provisions of this Article VIII, including, but not limited to, the repairing and/or replacement of its merchandise, trade fixtures and equipment to at least a condition equal to that prior to its damage or destruction. Tenant agrees to commence the performance of its work when notified by Landlord that such work can be commenced, and Tenant shall complete such work with 45 days thereafter.

8.5 Insurance Proceeds. All proceeds payable from Landlord's insurance policies with respect to the Demised Premises shall belong to and shall be payable to Landlord. If Landlord does not elect to terminate this lease as provided in Section 8.2, Landlord shall disburse and apply so much of any insurance recovery as shall be necessary against the cost to Landlord of restoration and rebuilding of Landlord's Work, subject to the prior rights of any holder of any mortgage liens against the Demised Premises.

8.6 Rent Abatement. During any periods in which the Demised Premises are damaged by fire or other casualty, and there is substantial interference with the operation of Tenant's business in the Demised Premises as a result of such damage or casualty so that Tenant must temporarily close its business to the public, the Fixed Minimum Rent and Additional Rent shall abate. Such abatement shall continue for the period commencing with the date of such fire or other casualty and ending thirty (30) days after completion by Landlord of any repair work which Landlord is required to perform under the provisions of this Article VIII or, in the event that Landlord elects to terminate this lease, until the date of termination. In the event of a destruction of only part of the Demised Premises, rent shall be abated equitably.

8.7 Waiver of Liability. Each party hereto does release and discharge the other party hereto and any partner, officer, director, stockholder, agent or employee of such party of and from any liability whatsoever

hereafter arising from loss, damage, or injury caused by fire or other casualty for which insurance (permitting waiver of liability and containing a waiver of subrogation) is carried by the injured party at the time of such loss, damage or injury to the extent of any recovery by the injured party under such insurance.

ARTICLE IX

REPAIRS, MAINTENANCE AND ALTERATIONS

9.1 Repairs. Landlord shall, within a reasonable period after receipt of notice from Tenant, make or cause to be made necessary structural repairs to the exterior walls and the roof (but excluding all windows, doors, plate glass, store fronts and signs and the frames surrounding the same) and shall keep in good order, condition and repair the exterior foundations of the Demised Premises, and the plumbing located within the Common Areas and/or outside of the building in which the Demised Premises are located. Landlord shall not be required to make any such repairs or installations where the need for same are necessitated, caused, or occasioned by (1) any act or omission of negligence by Tenant or its employees, agents, invitees, or contractors, (2) the requirements of the provisions of Section 13.1(c) hereof, or (3) fire or other casualty or condemnation, except as provided in Articles VIII and X hereof. Landlord shall provide reasonable protection of HVAC units.

9.2 Maintenance. (a) Tenant at its own cost and expense shall keep, replace and maintain in good order, condition and repair the Demised Premises. The aforesaid obligation of Tenant shall include, without limitation, all necessary painting and decorating, the replacement of any glass (including plate glass) which may be damaged or broken with glass of the same quality and strength, and repairs and installations necessitated pursuant to the provisions of Section 13.1(c) hereof.

(b) Tenant, at its own cost and expense, shall install and maintain in the Demised Premises fire extinguishers and other fire protection devices as may be required by governmental authorities having jurisdiction thereof or by the insurance underwriters insuring the building of which the Demised Premises form a part. If any governmental authority having jurisdiction over the Demised Premises requires or recommends the installation of or any change or alteration with respect to any sprinkler system, or the installation of additional sprinkler heads, by reason of Tenant's business, or the location of partitions, fixtures, equipment or other property in the Demised Premises, Tenant, at Tenant's own cost and expense, shall promptly make such changes, whether the work involved shall be structural or non-structural.

9.3 Alterations. After the Commencement Date, Tenant shall not make any alterations, replacements, improvements and/or additions to the Demised Premises or any part thereof without Landlord's prior written consent, which consent shall not be unreasonably withheld.

9.4 Failure to Repair. If Tenant shall fail to make any of the repairs required of it by the provisions of this lease, or to commence the performance of any of its obligations hereunder within ten (10) days after notice by Landlord (or without notice in an emergency), Landlord shall have the right (but not the obligation) to make such repairs or replacements, or perform maintenance work or any other work required of Tenant pursuant to this lease and charge the reasonable cost thereof to Tenant as Additional Rent.

ARTICLE X

CONDEMNATION

10.1 Eminent Domain. If the fee of the whole of the Demised Premises shall be taken for any public or quasi-public use under any statute or by right of eminent domain, or by private purchase in lieu thereof (herein the "Taking"), then this lease shall terminate as of the date of the Taking. If there is a Taking of any part of the Demised Premises which renders the remainder thereof unusable for the purposes for which the Demised Premises were leased, then Landlord and Tenant shall each have the right to terminate this lease on sixty (60) days notice to the other given within ninety (90) days after the date of such Taking. In the event this lease is terminated as provided in this Section, any prepaid Rent shall be equitably adjusted as of the date of such termination and Landlord shall reimburse Tenant for the undepriciated value of any fixtures and improvements made by Tenant in the Demised Premises.

10.2 Apportionment of Rent; Repairs. If there is a Taking of any part of the Demised Premises and this lease shall not terminate pursuant to the provisions of Section 10.1, then the Fixed Minimum Rent and Additional Rent shall be equitably apportioned according to the space so taken, and Landlord shall, at its own cost and expense, restore the remaining portion of the Demised Premises to the extent necessary to render same reasonably suitable for the purposes for which the Demised Premises were leased, and shall make all repairs to the building in which the Demised Premises are located to the extent necessary to constitute the remaining portion of the building a complete architectural unit, but such work shall not exceed the scope of work required to be done in the original construction of such building and the cost thereof shall not exceed the net proceeds of the condemnation award actually received and retained by Landlord and not required to be paid by Landlord to any other parties including the holder of any mortgage on the Shopping Center.

10.3 Compensation: Claims. All compensation awarded or paid upon a total or partial taking of the Demised Premises shall belong to and be the property of Landlord without any participation by Tenant. Nothing contained herein shall be construed to preclude Tenant, at its sole cost and expense, from independently prosecuting any claim directly against the condemning authority for loss of business and/or depreciation to, damage to, and cost of removal of stock, trade fixtures, furniture and other personal property belonging to Tenant; provided, however, that no such claim shall diminish or otherwise adversely affect Landlord's award or the award to any mortgagee.

ARTICLE XI

COMMON AREAS

11.1 Non-Exclusive Use; Non-Obstruction. Landlord shall make available within or adjacent to the Shopping Center such Common Areas, together with any Common Areas made available by means of cross easements and/or reciprocal construction, operating, and easement agreements (herein "RCOE Agreements"), as Landlord shall deem to be appropriate for the Shopping Center. Landlord shall operate and maintain such Common Areas for their intended purposes including, to the extent reasonably possible, keeping such Common Areas free of snow and ice and in a clean condition. Tenant shall have the non-exclusive right during the Term to use (for their intended purposes) the Common Areas for itself, its employees, agents, customers, invitees and licensees, subject, however, to the provisions of this Article XI. Landlord shall have the right, at any time, to change the size, location, elevation or configuration of the Common Areas, or any part thereof.

11.2 Control of Common Areas; Parking. All Common Areas shall be subject to the exclusive control and management of Landlord and Landlord shall have the right to establish, modify, amend and enforce uniform rules and regulations with respect to the Common Areas and the use thereof. Tenant agrees to abide by and conform with such rules and regulation upon notice thereof and to cause its invitees, licensees, employees, and agents so to abide and conform.

Landlord shall have the right (a) to close temporarily all or any portion of the Common Areas to discourage non-customer use, (b) to use portions of the Common Areas while engaged in making additional improvements, repairs, or alterations to the Shopping Center, (c) to transfer in whole or in part, any of Landlord's rights and/or obligations under this Article, to any other tenant(s), other occupants of the Shopping Center, or such other parties as landlord may from time to time determine, (d) to do and perform such other acts with respect to the Common Areas as, in the use of good business judgment, Landlord shall determine to be appropriate for the Shopping Center.

Tenant agrees to cause its employees, agents and licensees to park their respective automobiles, trucks and other vehicles only in such parking places in the Common Areas designated by Landlord from time to time as the employee parking area. Tenant shall not at any time interfere with the rights of Landlord and other tenants, their officers, employees, agents, licensees, customers or invitees to use any part of the parking areas and other Common Areas.

ARTICLE XII

ASSIGNMENT AND SUBLETTING

12.1 Prohibition. Tenant shall not assign, mortgage, pledge, or otherwise encumber this Lease or any part thereof, nor sublet any part of the Demised Premises without first obtaining the prior written consent of Landlord in each and every case, which consent shall not be unreasonably withheld. "Assignment" shall be deemed to include any transfer of the Tenant's interest in this lease by operation of law, the merger or consolidation the Tenant with or into any other firm or corporation, or the transfer or sale of a controlling interest in the Tenant whether by sale of its capital stock or otherwise. In the event Tenant seeks Landlord's consent pursuant to this Section 12.1, Tenant shall furnish Landlord with such information regarding the proposed assignee, sublease, or other entity as Landlord may reasonably require including, without limitation, information regarding: (i) financial ability, (ii) business experience relating to the use permitted hereunder, and (iii) good character of the proposed assignee or sublessee. In the event of the assignment or subletting by the Tenant for which Landlord's written approval has been obtained, Tenant shall remain primarily liable, jointly and severally, with the new Tenant for the payment of all Rent and for the performance of all agreements on the part of Tenant to be performed hereunder. A fee of \$250.00 and Landlord's reasonable attorneys' fees shall be paid by Tenant in connection with each proposed assignment, mortgage, pledge or sublet of the Demised Premises. Such sums shall be considered Additional Rent hereunder.

12.2 Termination by Landlord. Notwithstanding anything to the contrary in this Lease, the Landlord shall have the right to terminate the Lease in any situation where Landlord's consent to any proposed assignment or subletting is required and Tenant assigns or sub-lets the premises without obtaining such consent.

12.3 Termination by Landlord: Exceptions. The provisions of Section 12.2 with respect to Landlord's right to terminate the Lease shall not be applicable to an assignment of this Lease by the Tenant (i) to a wholly owned subsidiary (for such period of time as the stock of such subsidiary continues to be wholly owned by the Tenant, it being agreed that the subsequent sale or transfer of 25% or more of the stock of such subsidiary shall be treated as if such sale or transfer were an assignment of this Lease governed by the provisions of Section 12.2), or (ii) to a controlling corporation, or (iii) to a purchaser of the business of the Tenant, whether by the sale of stock or assets or otherwise, provided such purchase includes the purchase of all similar stores operate or owned by Tenant or any related or affiliated entity, and provided in all such events listed in clauses (i), (ii), and (iii) that such subsidiary, controlling corporation, or purchaser has agreed directly with the Landlord to be bound by all of the obligations of the Tenant hereunder, including, without limitation, the obligation to pay the Minimum Rent, the covenant to use the Leased Premises only for the purposes specifically permitted under this Lease, and the covenant against further assignment. Any such assignment shall not relieve the Tenant of any of its obligations hereunder.

For the purposes of this Lease, the entering into of any management agreement or any agreement in the nature thereof transferring control of the business operation of the Tenant in the Demised Premises, as well as any substantial percentage of the profits and losses thereof, to a person or entity other than the Tenant, or otherwise having substantially the same effect, shall be treated for all purposes as an assignment of this Lease and shall be governed by the provisions of this Article XII.

12.4 Sale of Stock or Partnership Interest. If the Tenant is a corporation, then the Tenant agrees that if there shall be a sale of fifty (50%) percent or more of the stock in the Tenant, or a merger by Tenant with another corporation with the result that the controlling shareholders of Tenant do not control the surviving corporation, the same shall be deemed an assignment and shall be governed by the provisions of this Article XII. The term "sale" shall include any transfer other than a transfer by operation of law upon the death of a stockholder and the devolution of the stock held by such stockholder to his heirs or legatees. Similarly, if Tenant is a partnership, trust or other entity, the provisions of Article XII shall be applied if there is a transfer of fifty (50%) percent or more of the beneficial interest in such entity, other than a transfer by operation of law upon the death of an interest holder.

12.5 No Waiver. Consent by Landlord, whether express or implied, to any assignment or sublease, shall not constitute a waiver of Landlord's right to prohibit any subsequent assignment or sublease, nor shall such consent be deemed a waiver of Landlord's right to terminate this Lease upon the terms and conditions set forth herein.

ARTICLE XIII

TENANT'S ADDITIONAL AGREEMENTS

13.1 Affirmative Covenants. Tenant agrees at all times during the Term, at its cost and expense, to:

- (a) keep the Demised Premises in a neat and clean condition;
- (b) use a sanitation contractor for the storage, removal and disposal of rubbish and trash from the Demised Premises, except for cardboard which is disposed of in the common recycling compactor of the Shopping Center, and to confine Tenant's rubbish in a covered exterior container which is located at the rear of the Demised Premises;
- (c) promptly comply with all laws, ordinances, rules and regulation of governmental authorities affecting the Demised Premises by reason of Tenant's business or for any other reason;
- (d) pay directly to the appropriate taxing authority, before delinquency, any and all taxes, assessments and public charges payable during the Term levied, assessed or imposed by any governmental authority upon Tenant's business or upon Tenant's leasehold interest, fixtures, furniture, or personal property installed or located in the Demised Premises, or which constitute a lien upon any of the foregoing;
- (e) obey and observe (and cause its employees, contractors, licensees, invitees, subtenants, and all others doing business with Tenant, to obey and observe) all reasonable rules and regulations established by Landlord during the Term for the government, conduct, and operation of Tenant and/or for the promotion of the safety, health, conservation of energy, and maintenance of good order within the Shopping Center, so long as the same are not discriminatory with respect to Tenant. Tenant agrees to pay for the cost of any personnel necessary for maintaining proper conduct by customers at the Demised Premises or in the common areas;
- (f) use a pest extermination contractor at such intervals as shall be required to keep the Demised Premises free from termites, carpenter ants, insects, and other vermin as Landlord may require.

13.2 Negative Covenants. Tenant agrees that it will not at any time during the Term, without first obtaining Landlord's prior written consent:

- (a) conduct or permit in the Demised Premises (i) any fire, bankruptcy, auction or "going out of business" sale, or (ii) any use for any purpose other than the retail sale of goods and services, and operations incidental thereto, or (iii) the utilization of any unethical method of business operation;
- (b) use, or permit to be used, any part of the Common Areas, or any other areas within the Shopping Center other than within the Demised Premises, for the sale, display or storage of any merchandise or for any other business, occupation or undertaking;
- (c) operate in the Demised Premises, or in any part of the Shopping Center, any coin operated vending machine or similar device for the sale of any goods, merchandise, food, beverages and/or services (including but not limited to, pay telephones pay-lockers, pay-toilets, scales, amusement devices and machines for the sale of beverages, foods, candy, cigarettes, or other commodities);
- (d) use any loudspeakers, phonograph, or other devices of similar nature in such manner as to be heard outside of the Demised Premises;
- (e) permit the emission of any noise, fumes, smoke, or objectionable light from the Demised Premises;
- (f) take any action which would create any work stoppage, picketing, labor disruption or dispute, or any interference with the business of the landlord or any occupant of the Shopping Center or with the rights and privileges of any occupant, lessee, or tenant of the Shopping Center, or any customer or other person(s) lawfully in and about the Shopping Center, or cause any impairment or reduction of the good will of the Shopping Center;
- (g) burn any rubbish or trash in or about the Demised Premises or the Shopping Center;
- (h) permit deliveries to the Demised Premises except through delivery areas;

(i) sell, distribute, display or offer for sale any item which, in Landlord's good faith judgment, is inconsistent with the quality of operation of the Shopping Center or may tend to injure or detract from the moral character or image of the Shopping Center within the community. Without limiting the generality of the foregoing, Tenant shall not sell, distribute, display, or offer for sale any paraphernalia commonly used in the use or ingestion of illicit drugs, or any x-rated, pornographic, lewd, or so called "adult" newspapers, books, magazines, films, pictures, video tapes, video disks, or other similar merchandise.

(j) permit the creation, discharge, or presence in or about the Demised Premises of any hazardous materials or wastes. Without limiting the generality of the foregoing, Tenant shall not discharge into the Shopping Center sewage system any organic chemical including paint thinner, oil, cleaning solvents, paints, pesticides, or similar materials.

13.3 Signs. Tenant shall have the right to (i) install a sign in Landlord's existing pylon sign(s) and (ii) install and maintain in good repair a sign over the entrance to the Demised Premises, each at its sole cost and expense, including the cost of electricity for the sign over the entrance. Tenant agrees to comply with the following conditions in connection with installation of any sign which replaces the existing sign:

(i) prior to installation of such signs, Tenant shall, at its sole cost and expense, obtain all permits and approvals from local governmental authorities which are necessary for the installation of such signs;

(ii) such signs shall be professionally made, shall be consistent with any design standards established by Landlord. Landlord shall have approved, in writing, Tenant's plans for its signs as to dimension, content, material, location and design prior to erection; and

(iii) such signs, when installed, shall comply with all requirements of governmental authorities having jurisdiction thereof, including having an area of no more than 1.5 square feet for every lineal foot of store frontage.

(iv) raised letter signs shall be no more than 24" high and shall be installed on a raceway. Box signs shall be no more than 36 inches high. All signs shall be located equal distances from the top and bottom of the 48 inch wide sign band.

(v) Tenant shall remove all signage upon expiration or earlier termination of this Lease, and shall repair any damage caused by such removal.

Tenant may not install any sign(s) in the parking areas, roof, exterior walls, interior and exterior surfaces of windows and doors, or elsewhere in or on the Demised Premises or the Shopping Center, except as provided in this Section 13.3, without first obtaining Landlord's approval. Tenant shall not install any flashing signs and may not tape any signs to any windows or doors.

ARTICLE XIV

(NOT USED)

ARTICLE XV

UTILITIES

15.1 Payment of Utilities. As Additional Rent, Tenant agrees to pay promptly, as and when the same become due and payable, all charges for water, sewer, electricity, gas, heat, air conditioning, ventilating, lighting systems, and other utilities relating to Tenant's use of the Demised Premises during the Term. If any such utilities are not separately metered or assessed, Tenant agrees to pay Landlord, as Additional Rent, upon submission of a statement for same, the charges for such utilities as reasonably determined from time to time by Landlord, in addition to Tenant's payment for all separately metered utility charges. Any such utility service supplied by Landlord to the Demised Premises shall be deemed to have been supplied by Landlord as an

Incidence of the tenancy created by this lease. All utilities now serving the Demised Premises are separately metered.

15.2 Electrical Capacity. Tenant covenants and agrees that at all times its use of electric current shall never exceed the capacity of the feeders to the Demised Premises or the wiring installations therein.

ARTICLE XVI

ADDITIONAL RENT

16.1 Common Costs: Right to Examine Books. Tenant covenants and agrees to pay, as Additional Rent, its share of Common Costs for each Lease Fiscal Year. Tenant's share of said Common Costs shall be equal to the product of (a) "Tenant's Pro Rata Share" (herein below defined) and (b) the total of said Common Costs.

Tenant's Pro Rata Share shall be a fraction, the numerator of which is the Gross Leasable Area of the Demised Premises and the denominator of which is the Gross Leasable Area of all buildings, or portions thereof, (but excluding any basement space used solely for storage) occupied by tenants in the Shopping Center. As of the date of execution of this Lease, the Gross Leasable Area of the Shopping Center is 140,779 square feet.

Landlord shall notify Tenant from time to time of the amount which Landlord estimates will be the amount of the Common Costs for such Lease Fiscal Year and Tenant shall pay to Landlord Tenant's Pro Rata Share of such amount in equal monthly installments in advance on or before the first day of each month. The current estimate for Tenant's share of Common Costs is set forth in Section 1.1(e) above. Landlord shall submit to Tenant annually a statement showing the Common Costs to be paid by Tenant with respect to such year, the amount thereof paid by Tenant during such Lease Fiscal Year, and the amount of the balance due, or overpayment, as the case may be. Appropriate adjustment shall thereupon be made between the parties, on demand, on the basis of such statement. Each statement shall be binding upon Tenant, its successors and assigns as to the matters set forth therein, if no objection is raised with respect thereto within ninety (90) days after submission of each statement to Tenant. Tenant shall have the right to examine Landlord's books and records at the offices of Landlord during ordinary business hours, for the purposes of verifying the matters set forth in the statement for the immediately preceding Lease Fiscal Year, which right shall not be unreasonably exercised.

16.2 Real Estate Taxes. (a) Landlord shall pay, or cause to be paid, before the same become delinquent, all Real Estate Taxes provided, however, that if Landlord deems the Real Estate Taxes to be excessive, the Landlord may defer payment to the extent permitted by applicable law so long as the validity or amount of said Real Estate Taxes is contested by the Landlord in good faith and so long as the Tenant's occupancy of the Demised Premises is not disturbed or threatened.

(b) The Tenant shall pay all taxes which may be lawfully charged, assessed, or imposed upon all fixtures, equipment and personal property in the Demised Premises. Tenant shall pay all license fees and other charges which may lawfully be imposed upon the business of the Tenant conducted upon the Demised Premises.

(c) Tenant shall, during the term of this lease, pay to the Landlord that portion of the Real Estate Taxes as shall be equal to the product of (a) Tenant's Pro Rata Share (as defined above) and (b) the total amount of Real Estate Taxes.

The Tenant's Pro Rata Share of Real Estate Taxes shall be equitably adjusted for and with respect to the first and last partial tax years (if any) beginning or ending during the term of this lease. Where the applicable tax bills and computations are not available prior to the end of the Term hereof, a tentative computation shall be

made on the basis of the previous year's Real Estate Taxes payable by Tenant, with a final adjustment to be made between Landlord and Tenant promptly after all bills and computations are available for such period.

The Tenant's Pro Rata Share of Real Estate Taxes shall be due and payable within fifteen (15) days after receipt by the Tenant of the Landlord's invoice plus a copy of the tax bills involved. However, the Tenant shall make monthly tax deposits with the Landlord (along with payments of minimum rent) in an amount equal to one-twelfth (1/12th) of the Tenant's annual Pro Rata Share of Real Estate Taxes, with a final adjustment to be made between the parties as soon as said Pro Rata Share has been determined. The amount of such tax deposits shall be as reasonably estimated by the Landlord.

In every case, Real Estate Taxes shall be adjusted to take into account any abatement or refund thereof paid to the Landlord, less all of the Landlord's costs of securing such abatement or refund (the Landlord having the sole right to contest Taxes). If Landlord shall elect to contest such Real Estate Taxes, Landlord shall be entitled to bill Tenant for its Pro Rata Share of the costs and expenses thus incurred by Landlord by inclusion of such costs with the Common Costs described above.

(d) In the event that any governmental authority having jurisdiction over the Shopping Center imposes a tax or assessment of any kind or nature upon, against, or measured by the rentals payable by tenants in the Shopping Center to the Landlord, or with respect to the ownership of the land and buildings comprising the Shopping Center, by way of substitution for all or part of the present ad valorem real estate taxes, or in addition thereto, then such tax and/or assessment shall be deemed to constitute "Real Estate Taxes" for the purposes of this lease and the Tenant shall be obligated to pay its proportionate share thereof as set forth above.

16.3 Nonpayment of Additional Rent. In the event of nonpayment of any Additional Rent when due under this lease, Landlord shall have the same remedies as for the nonpayment of Fixed Minimum Rent. In addition, Landlord, at its option, shall be entitled to the payment of interest from Tenant at the rate of twelve percent (12%) per annum on any past due payment.

ARTICLE XVII

CERTAIN ADDITIONAL DEFINED TERMS

The following terms shall have the meanings set forth herein:

(a) "Common Area" means all that part of the Shopping Center which is not intended for lease to tenants of the Shopping Center, including, without limitation, the land and facilities utilized as parking lots, access and perimeter roads, truck passageways and loading platforms, landscaped areas, exterior walks, stairs, underground storm and sanitary sewers and/or septic system, utility lines, washrooms, toilets and other public facilities, and the like. Any portion of the Shopping Center so included within Common Areas shall be excluded therefrom when designated by Landlord for a non-common use, and any portion thereof not previously included within the Common Areas shall be included when so designated and improved for common use.

(b) "Common Costs" shall mean the total costs and expenses incurred by Landlord, its agents, and/or designees for owning, operating, maintaining, repairing and/or replacing all or any part of the Shopping Center, which costs and expenses shall include, but shall not be limited to the following:

- (i) maintenance, repair or replacement of air conditioning equipment, heating equipment, plumbing systems, sprinkler systems, electrical systems, and the roof;
- (ii) the total costs and expenses incurred in cleaning, planting, replanting, mulching, and maintaining the landscaping of the common facilities of the Shopping Center;
- (iii) the cost of all Landlord's insurance including, but not limited to, fire and other casualty, bodily injury, public liability, property damage liability, flood and earthquake insurance, workmen's compensation insurance, rent loss and any other insurance carried by Landlord for the Shopping Center;
- (iv) repair, repaving and line repainting of the parking lot;
- (v) exterior painting;
- (vi) rental and maintenance of signs and equipment;
- (vii) repair and replacement of exterior lighting, security systems, fire protection systems and sprinkler systems;

- (viii) exterminating and sanitary control;
- (ix) plowing and removal of snow, removal of trash, rubbish, garbage and other refuse;
- (x) repair and replacement of on-site water lines, electrical lines, gas lines, sanitary sewer lines, septic systems, storm drainage systems and all other utilities;
- (xi) all electrical, water, sewer, and other utility charges for serving the Common Areas, (but excluding water and sewer charges for the Demised Premises which are separately assessed);
- (xii) the cost of all personnel necessary to implement such services and maintain the Shopping Center, including wages, salaries (including employee benefits, unemployment insurance and social security payments) of maintenance and security personnel;
- (xiii) all promotional, advertising, public relations and related administrative costs for the Shopping Center and/or its tenants;
- (xiv) personal property taxes, sales and use taxes on material, equipment, supplies and services;
- (xv) fees for required licenses and permits, fire, security and police protection, sprinkler systems;
- (xvi) a commercially reasonable charge to cover Landlord's administrative overhead; and
- (xvii) a commercially reasonable management fee.

(c) "Concessionaire" means any person, corporation or other entity which conducts any business in any portion of the Demised Premises as a subtenant or under any concession or license from Tenant, whether or not Tenant was authorized under the provisions of this lease to grant such lease, license or concession.

(d) "Gross Leasable Area" means, with regards to the premises occupied by any tenant of the Shopping Center, the total number of square feet of floor space on all floors of the premises demised, measured to the outside of exterior walls on the first floor, or the inside of the exterior walls in any basement, and to the center line of interior walls separating the Demised Premises from any other space;

(e) "Index" means the Consumer Price Index for all Urban Consumers (CPI-U), Boston, Massachusetts, All Items published by the United States Bureau of Labor Statistics, or its successor index.

(f) "Landlord" means the owner, or the mortgagee in possession, of the building in which the Demised Premises are located.

(g) "Lease Fiscal Year" means each period of January 1 through December 31 during the Term, except that the first Lease Fiscal Year shall be the period from the Commencement Date through December 31 following the Commencement Date, and the last Lease Fiscal Year shall be the period from January 1 next preceding the Termination date up to and including the Termination Date.

(h) "Occupant" means any person, corporation or other entity which occupies any portion of, or conducts any business in, the Shopping Center, whether as a tenant, licensee, concessionaire or fee owner provided, however, that Landlord shall not be deemed to be an "Occupant" except to the extent, if any, that Landlord is then conducting a retail business with the general public in the Shopping Center.

(i) "Shopping Center" means the land and buildings comprising the Shopping Center described Section 2.1 hereof plus or minus, as the case may be, any other parcels of land at any time designated by Landlord to be added thereto or removed therefrom, as the case may be, which are used for the Shopping Center or related purposes, together with all present or future buildings thereon and all easements across adjoining parcels of land.

Landlord hereby reserves the right, at any time, to make alterations or additions to the Shopping Center, to construct additional stories on the building in which the Demised Premises are located, to construct adjoining buildings and separate buildings, to enlarge the Shopping Center, and to make any other alterations therein so long as such changes do not interfere with Tenant's use of the Demised Premises.

(j) "Real Estate Taxes" means all taxes and assessments, special or otherwise, assessed upon or with respect to the ownership and/or all other taxable interest in the Shopping Center imposed by federal, state or local governmental authority having jurisdiction of the Shopping Center. In the event that any governmental authority having jurisdiction over the Shopping Center imposes a tax or assessment of any kind or nature upon, against, or measured by the rentals payable by tenants in the Shopping Center to the Landlord, or with respect to the ownership of the land and buildings comprising the Shopping Center, by way of substitution for all or part

of the present ad valorem real estate taxes, or in addition thereto, then such tax and/or assessment shall be included in Real Estate Taxes.

ARTICLE XVIII

DEFAULTS AND REMEDIES

18.1 Defaults; Remedies. The following events shall be considered to constitute a default under this lease:

- (i) default in the payment of any Rent, or any other sum or charge due to Landlord, or any other party, under this lease within five (5) days of when due, no prior demand therefor being required;
- (ii) default in the full, faithful and punctual performance of any other covenant, agreement, or provision in excess of twenty (20) days after notice or after such performance is otherwise required under the provisions of this lease;
- (iii) causing or permitting the Demised Premises to become vacant, not being open for business to the public after the Commencement Date, permitting any execution or attachment against Tenant or the leasehold estate of Tenant created by this lease, permitting any of the Tenant's property upon the Demised Premises to be taken or occupied by other than the Tenant, or damaging any portion of the Shopping Center by negligence or other act or omission; or
- (iv) defaulting in any obligation under the provisions of this lease;
- (v) making an assignment for the benefit of creditors, filing a voluntary petition in bankruptcy, being adjudicated a bankrupt by any court, taking the benefit of any bankruptcy or insolvency statute, being dissolved, or if a receiver or trustee of Tenant and/or its property shall be appointed;
- (vi) causing any interest of Tenant in this lease to pass to any other party other than Tenant without the written consent of Landlord, or to any trustees or receiver or assignee for the benefit of creditors or by operation of law or otherwise;

In the event of any such default enumerated in this Section 18.1, Landlord shall have the right, at its option, without any further demand or notice, to reenter the Demised Premises (Tenant hereby waiving any and all statutory notice of reentry), and vacate all occupants therefrom, using all necessary force so to do, remove the property of Tenant and any other Occupant, and store all such property in a public warehouse or elsewhere at the cost, and for the account of Tenant or any other Occupant, and either:

(a) declare the Term to be at an end on a day designated by Landlord (which shall be not less than five (5) days after notice to Tenant of such declaration) in which event the Term shall expire on the day so designated and Tenant shall immediately pay Landlord, as liquidated damages, a sum equal to the amount, if any, by which the then cash value of the total Rent and other charges that Tenant would have been required to pay under the provisions of this lease for the period which otherwise would have been the balance of the Term, exceeds the then cash value of the fair and reasonable rental value of the Demised Premises for the same period;

(b) without declaring the Term to be at an end, relet the Demised Premises, or any part thereof, as the agent and for the account of Tenant, upon such terms and conditions as landlord may deem advisable. In such event the rents (and other money) received from such re-letting, less all costs including the cost of necessary renovations of the Demised Premises, reasonable attorney's fees and disbursements, and any real estate commissions actually paid, shall be applied toward the Rent and all costs, charges, and expenses due to Landlord hereunder. If a sufficient sum shall not be thus realized to pay the total of all amounts due, Tenant shall pay Landlord any deficiency monthly, and Landlord may bring action(s) therefore as such monthly deficiencies shall arise; or

(c) pursue any other remedy or relief available to the Landlord under applicable law.

For purposes of this Section 18.1, the "fair and reasonable rental value of the Demised Premises" shall be determined on the basis of a tenant paying not only a return to Landlord for the use and occupancy of the Demised Premises, but also other moneys, costs, charges and expenses as are required to be paid by Tenant under the terms of this lease. The term "then cash value" means the amount in question discounted at the rate of four percent (4%) per annum to present worth.

18.2 Cure by Landlord. In the event of any default of this lease by Tenant, Landlord may (but shall not be obligated to) at any time, after five (5) days written notice to Tenant, except in emergency situations (for which no notice shall be required), cure such default for the account, and at the expense, of Tenant. If landlord at any time so elects or is compelled by any other person to cure such default, or is compelled to incur any other expense arising out of such default by Tenant (including reasonable attorneys' fees and disbursements in instituting, prosecuting or defending any suits, actions or proceedings to enforce Landlord's rights under the provisions of this Lease), the sums so paid by Landlord, with all interest, costs and damages, shall be paid by Tenant to Landlord as Additional Rent within five (5) days following written demand.

18.3 Non-Exclusive Remedies: Re-Entry. Any remedies specifically provided for in this lease are in addition to, and not exclusive of, any other remedy available to Landlord. If Tenant breaches any of its covenants, agreements, terms or conditions contained in this lease, Landlord, in addition to any and all other rights, shall be entitled to enjoin such breach and shall have the right to invoke any right and remedy allowed at law or in equity or by statute or otherwise for such breach as though re-entry, summary proceedings, and other remedies were not provided for in this lease. Any re-entry by Landlord shall be allowed by Tenant without interference or hindrance and Landlord shall not be liable for damages for any such re-entry nor guilty of any trespass.

Any re-entry or taking possession of the Demised Premises by Landlord shall not be construed as an election on Landlord's part to terminate this lease unless a notice of such termination intention is given to Tenant or unless the termination of this lease is decreed by a court of competent jurisdiction.

ARTICLE XIX

SURRENDER OF DEMISED PREMISES

19.1 Condition of Demised Premises. On the last day of the Term, or upon termination of this lease prior thereto as herein provided, Tenant shall quit and surrender the Demised Premises, broom clean, in good order, condition, and repair, reasonable wear and tear excepted, together with all alterations, additions, improvements, equipment and fixtures which may have been made, on or to the Demised Premises. Subject to the provisions of Section 18.2 hereof, Tenant shall, on or before the end of the Term, remove from the Demised Premises all of its property including movable furniture and unattached movable trade fixtures installed at Tenant's cost and expense, together with any alterations, additions and improvements, the removal of which is requested by Landlord. Any or all of such property not so removed shall, at Landlord's option, become the exclusive property of Landlord or be disposed of by Landlord at Tenant's cost and expense, without further notice to, or demand upon, Tenant.

19.2 Failure to Surrender. If the Demised Premises are not surrendered to Landlord at the end of the Term, or upon the termination of this lease prior thereto as herein provided, Tenant shall indemnify Landlord against all loss or liability resulting from delay by Tenant in so surrendering the Demised Premises, including without limitation, any claims founded on such delay made by any succeeding occupant of the Demised Premises or any part thereof. Tenant shall be liable to Landlord for legal fees, costs, and expenses incurred by Landlord to obtain possession of the Demised Premises and for any claim made by any succeeding Occupants based upon such delay. Tenant's obligation under this Article XIX shall survive the expiration or sooner termination of the Term.

ARTICLE XX

SUBORDINATION, ATTORNMEN, AND RECOGNITION

20.1 Mortgages: Underlying Leases: RCQE Agreements. This lease, at the option of Landlord (by notice sent to Tenant) shall be subject and subordinate to all ground or underlying leases or subleases that

include the Demised Premises, including, without limitation, a sale leaseback lease to which landlord is, or may become a party as a tenant or subtenant thereunder, and to all mortgages, in all amounts and all advances thereon, which may now or hereafter constitute a lien on the Demised Premises, and to all renewals, replacements, modifications, consolidations and extensions of any thereof. This lease shall also be subject and subordinate to the provisions of any RCOE Agreements (as defined in Section 11.1 hereof).

20.2 Instruments and Certificates of Subordination. The provisions of Section 20.1 shall be self-operative and no further instrument of subordination shall be required by any such lessor or mortgagee. If Landlord requests confirmation of the subordination provided for in Section 20.1, Tenant shall, without charge, promptly execute and deliver to Landlord any certificate or instrument which landlord may at any time request in connection therewith. Any such certificate or instrument may, at the option of such lessor or mortgagee, contain the provisions set forth in Section 20.3 and/or 20.4 hereof. Upon request and without charge, Tenant shall promptly execute and deliver to the holder of any mortgage that liens the Demised Premises and/or to any lessor under a ground lease or underlying lease that includes the Demised Premises, an instrument acknowledging any assignment by Landlord of landlord's rights under this lease to any such holder or lessor in connection with such mortgage and/or such ground or underlying lease.

Upon the request of Tenant, Landlord agrees to make every good faith effort to procure from any mortgagee or lien holder a Subordination and Recognition Certificate recognizing Tenant's rights under this lease, provided that Tenant is not in default under the lease.

20.3 Attornment to Mortgagee. At the request of the holder (or successor in interest) of any mortgage and/or of a lessor's interest in any ground or underlying lease, Tenant shall attorn to, and recognize as Tenant's landlord hereunder, such holder or successor. Upon such attornment, this lease shall continue in full force and effect as a direct lease between Tenant and such holder or successor except that such holder or successor shall not be:

- (i) liable for any previous act or omission by Landlord under this lease;
- (ii) subject to any offset of Rent which may have previously accrued to Tenant against Landlord;
- (iii) bound by any previous modification of this lease not expressly provided for herein unless such modification shall have been expressly approved in writing by such holder or successor; or
- (iv) bound by any previous prepayment of Rent for a period of greater than one (1) month in advance (exclusive of any Security Deposit) unless such prepayment shall have been expressly approved in writing by such holder or successor.

20.4 Attornment to Owner of Demised Premises. If at any time during the Term, Landlord shall be the holder of a leasehold estate covering premises which include the Demised Premises, and if such leasehold estate shall terminate or be terminated for any reason, Tenant agrees, at the election and upon demand of any owner of such premises which include the Demised Premises, to attorn from time to time, to any such owner, upon the terms and conditions set forth herein for the remainder of the Term. The foregoing provision shall inure to the benefit of any such owner, and shall be self-operative upon any such demand, without requiring any further instrument to give effect to said provisions. Tenant, however, upon demand of any such owner, agrees to execute from time to time, an instrument confirming the foregoing provisions, reasonably satisfactory to such owner, in which Tenant shall acknowledge such attornment and shall set forth the terms and conditions of its tenancy which shall be the same as those set forth herein and same shall apply for the remainder of the Term. Nothing contained in this Section 20.4 shall be construed to impair any, right, privilege or option of any such owner.

20.5 Mortgagee's Rights to Cure. Upon request of Landlord, Tenant shall give prompt written notice to any Mortgagee of any default of Landlord under this lease, and Tenant shall allow such mortgagee a reasonable length of time (in any event, not more than thirty (30) days from the date of such notice) in which to cure any such default.

20.6 Mortgage; Mortgagee. The term "mortgage" as used in this lease will include a mortgage, a deed of trust, a deed to secure debt and any other conveyance or agreement for security purposes, which may now or

hereafter affect the real property and/or the improvements thereto of which the Demised Premises form a part. The term "mortgagee" and/or "holder of a mortgage" as used in this lease shall include the holder of or the beneficiary under, as the case may be, a mortgage, deed of trust, deed to secure debt or any other conveyance or agreement for security purposes, which may now or hereafter affect the real property and/or the improvements thereto of which the Demised Premises form a part.

ARTICLE XXI

GENERAL PROVISIONS

21.1 Quiet Enjoyment of Demised Premises. Landlord covenants that it has full right, power and authority to enter into this lease and that Tenant, on paying the Rent and observing, performing and keeping all of the obligations, covenants, agreements, conditions and provisions of this lease, shall lawfully, peaceably and quietly have, hold and enjoy the Demised Premises during the Term without hindrance, ejection or molestation by any persons lawfully claiming under Landlord, subject to all of the terms and provisions of this lease.

21.2 Landlord/Tenant Relationship. Neither party hereto shall be deemed in any way, for any purpose, to have become by the execution of this lease, a partner or joint venturer of the other party in its business or otherwise.

21.3 Choice of Law. This lease shall be governed exclusively by the provisions hereof and by the laws of the State of Maine.

21.4 Holding Over. If Tenant shall remain in possession of the Demised Premises after the end of the Term without the execution of a new lease, Tenant, at the option of Landlord, shall be deemed to be occupying the Demised Premises as a tenant from month to month. The rental payable by Tenant shall automatically increase to an amount equal to twice the sum of (a) the monthly installments of Fixed Minimum Rent payable during the last month of the Term, and (b) the average Percentage Rent payable or paid hereunder for the last three (3) Lease Fiscal Years, and (c) all other items of Additional Rent payable or paid on an unamortized basis during the last Lease Fiscal Year of the Term, otherwise subject to all of the other provisions, conditions and obligations of this lease. Tenant shall not interpose any counterclaims in a summary proceeding or other action based on holdover. Any option exercised by Landlord pursuant to this Section 21.4 shall not constitute a waiver of the provisions of Article XIX hereof.

21.5 Right of Entry. Landlord and its designees shall have the right to enter the Demised Premises during reasonable business hours upon reasonable notice (and in emergencies at all times), for any purpose connected with Landlord's right or obligations under this lease or for any other lawful purpose.

21.6 Successors and Assigns. The terms and provisions of this lease shall be binding upon and inure to the benefit of Landlord and Tenant and their respective successors, assigns, heirs, administrators, executors and representatives. Nothing in this Section 21.6 shall be deemed to authorize or permit any assignment or other transfer of the interest of Tenant in violation of any other provisions of this lease, but any person or entity occupying the Demised Premises, or any portion thereof, as a result of such assignment or transfer in violation of the provisions of this lease, shall be bound by all of the obligation of Tenant hereunder, but shall not be entitled to any of the benefits of Tenant hereunder.

21.7 Estoppel Certificates. At any time within ten (10) days after request by Landlord, and without charge, Tenant shall execute, acknowledge and deliver to landlord, or to Landlord's designee, a statement in writing stating:

- (i) that this lease is unmodified and in full force and effect or, if there have been modifications, that the same is in full force and effect with such modifications;
- (ii) the Commencement Date and Termination Date;
- (iii) that all conditions to be performed by landlord under this lease have been performed, or stating those claimed by Tenant not to have been performed;

- (iv) that there are no defenses or offsets against Landlord, or stating those claimed by Tenant;
- (v) the obligation for the payment of Fixed Minimum Rent has commenced and the date to which Fixed Minimum Rent and other charges have been paid in advance, if any; and
- (vi) such other representations as shall be requested by Landlord or Landlord's designee.

21.8 Brokerage. Tenant represents and warrants that it has not had any dealings with any realtor or broker in connection with negotiation of this lease other than the Broker, if any, set forth in Section 1.1(i) hereof.

21.9 Notices. All notices, demands, requests, approvals, authorizations, offers, or agreements hereunder by either party to the other shall be deemed to be given to the other party for the purposes of this lease only if in writing and sent by certified mail, return receipt requested, postage prepaid and addressed to the recipient at the address appearing on the first page of this lease, or such other address as either party shall designate by notice from time to time. If so served or sent, any such matter shall be deemed given for all purposes hereunder upon depositing same at a Postal Office. Alternatively, notice may be served in person, but shall be effective only upon receipt.

21.10 Joint and Several Liability. If at any time the term "Tenant" shall include more than one person or entity, or shall be a partnership, the obligations hereunder of all such persons and/or entities shall be joint and several.

21.11 Waivers. The failure of Landlord to insist in any one or more cases upon the performance of any of the provisions, covenants, agreements, or conditions of this lease, or to exercise any option herein contained, shall not be construed as a waiver or a relinquishment for the future of any such provisions, covenant, agreement, condition or option. Receipt by Landlord of Rent, of any other payment, or the acceptance by Landlord or performance of anything required to be performed by Tenant, with or without knowledge of the breach of a covenant, shall not be deemed a waiver of such breach. No waiver of any provision, covenant, agreement or condition of this lease shall be deemed to have been made unless expressed in writing and signed by the party against whom such waiver is charged.

21.12 Amendments. This lease may not be changed orally, but only by an agreement in writing signed by the party against whom enforcement of any change, modification or discharge is sought.

21.13 Redemption. Tenant hereby waives any and all rights of redemption granted by or under any present or future laws in the event that Tenant is evicted for cause or in the event of landlord obtaining possession of the Demised Premises by reason of the violation by Tenant of any of the provision or conditions of this lease, or otherwise.

21.14 Other Commercial Use. Nothing contained in this lease shall be deemed to prevent the erection by Landlord in the Shopping Center of one or more office buildings, or the use of any other building in the Shopping Center for office or other commercial use.

21.15 Captions and Headings. As used in this lease, and when required by the context, each number (singular or plural) shall include all numbers, and each gender shall include all genders. The captions and headings throughout this lease are for convenience or reference only and the words contained therein shall in no way be held or deemed to define, limit, explain, modify, amplify or add to the interpretation, construction, or meaning of any provision of or the scope or intent of this lease, nor in any way affect this lease. The term "person" as used herein means person, firm, association, or corporation, as the case may be.

21.16 Entire Agreement. There are no oral agreements between the parties hereto affecting this lease, and this lease supersedes and cancels any and all previous negotiations, arrangements, agreements or leases between the parties with respect to the Demised Premises, and none thereof shall be used to interpret or construct this lease.

21.17 Recording of Lease. Tenant shall not record this lease without the written consent of Landlord. However, upon the request of either party hereto, the other party shall join in the execution of a memorandum of this lease for the purpose of recording and either party may record same at the sole cost and expense of the

party so recording. Said memorandum shall describe the parties, the Demised Premises, the Term of this lease, any special provisions, and shall incorporate this lease by reference, but shall not include provisions relating to Rent unless requested by Landlord.

21.18 Notices to Mortgagees. After receiving notice from any person, firm, or other entity that it holds a mortgage which includes the Demised Premises as part of the mortgaged premises, or that it is the lessor under a ground or underlying lease which includes the Demised Premises, no notice from Tenant to landlord shall be effective unless and until a copy of the same is given to the holder of such mortgage or to such lessor in accordance with Section 21.9 hereof. The curing of any of Landlord's defaults by such mortgagee or lessor, shall be treated as performance by Landlord.

21.19 Assignment of Rents. In the event that Landlord assigns Landlord's interest in this lease, or the rents payable hereunder, to the holder of a mortgage, or to a lessor under a ground or underlying lease on the property which includes the Demised Premises, Tenant agrees:

(i) that the execution thereof by Landlord, and the acceptance thereof by such holder or lessor shall never be treated as any assumption by such holder or lessor of any of the obligations of Landlord, unless such holder or lessor shall, by notice to Tenant, specifically otherwise elect; and

(ii) that except as aforesaid, such holder or lessor shall be treated as having assumed Landlord's obligations hereunder only upon the foreclosure of such holder's mortgage and the taking of possession of the Demised Premises, or, in the case of a ground or underlying lessor, the assumption of landlord's position hereunder by such lessor.

21.20 Other Tenants. Landlord reserves the absolute right to create or change other tenancies in the Shopping Center as Landlord shall determine is desirable in the exercise of its sole business judgment, subject to the limitations, if any, set forth in Section 6.5. Tenant does not rely on the fact, nor does Landlord represent, that any specific Tenant or occupant, or a particular number of tenants, will occupy any space in the Shopping Center during the Term. A vacation of premises, or cessation of operation, by any other tenant in the Shopping Center shall not in any way release Tenant from its obligations under this lease.

21.21 Inability to Perform. If Landlord or Tenant is delayed or prevented from performing any of its obligations under this lease by reason of strike, labor troubles, Acts of God, or any cause whatsoever beyond Landlord's reasonable control, the period of such delay or such prevention shall be deemed added to the time herein provided for the performance of any such obligation by Landlord or Tenant.

21.22 Corporate Tenant. If Tenant is a corporation, the person(s) executing this lease on behalf of Tenant hereby covenant and warrant that: Tenant is a duly formed corporation qualified to do business in the state in which the Shopping Center is located; all Tenant's franchise and corporate taxes have been paid to date; all future forms, reports, fees and other documents necessary for Tenant to comply with applicable laws will be filed by Tenant when due; and such persons are duly authorized by such corporation to execute and deliver this Lease on behalf of the corporation.

21.23 Severability. If any term or provision of this lease, or any portion of a term or provision hereof, or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this lease, or the application of such term or provision or portion hereof to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each term and provision of this lease and each portion thereof shall be valid and be enforced to the fullest extent permitted by law.

In the event of such invalidity or unenforceability by reason of the laws of the State of Maine, or otherwise, then at Landlord's option, such invalid or unenforceable provisions of this lease shall be deemed ipso facto to be superseded and replaced herein by the applicable provisions of law relating to the subject matter covered by any such invalid or unenforceable provisions of this lease with the same force and effect as though such applicable provisions of law were originally set forth herein. It is the intention of the parties hereto that if any term or provision of this lease is capable of two constructions, one of which would render the term or provision void under applicable law and the other of which would render the term or provision valid under applicable law, then such term or provision shall have the meaning which renders it valid.

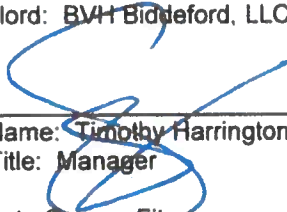
ARTICLE XXII

SECURITY DEPOSIT

22.1 Security Deposit. Upon execution of the Lease, Tenant shall pay the sum set forth in Section 1.1(f) which is to remain on deposit with Landlord during the term of this lease and any extensions as security for the payment of any and all Fixed Minimum Rent, Percentages Rent, Additional Rent and other charges due hereunder and the full and faithful performance by Tenant of the covenants and conditions of his lease. In the event of any default, the sum shall be retained by Landlord and may be applied toward damages arising from such default. Said deposit shall not be construed as liquidated damages. Upon yielding of said Demised Premises at the termination of this lease, and provided no default has occurred, said sum shall be returned to the Tenant. No interest shall be payable on the deposit. It is understood that Landlord shall always have the right to apply said deposit, or a portion thereof, to the curing of any default that may exist. Should Landlord convey its interest under this lease, the deposit, or the part or portion thereof not previously applied, shall be turned over to the Landlord's grantees or assignees; and Tenant hereby releases Landlord from any liability with respect to the deposit and Tenant agrees to look solely to such grantee or assignee and this provision shall also apply to subsequent grantees or assignees. Tenant agrees it will not assign, pledge, mortgage, or otherwise hypothecate its interest in the security deposit. It is agreed that the sum is not made in payment of rent but is paid solely as security by Tenant for the full and faithful performance of the obligations and terms of the lease. Should the entire deposit, or any portion thereof, be appropriated and applied by Landlord for the payment of overdue rent or other sums due and payable to Landlord by Tenant, then Tenant shall, upon written demand by Landlord, remit to Landlord a sufficient amount in cash to restore said security to the original sum deposited, and Tenant's failure to do so within five (5) days after receipt of such demand shall constitute a breach of this lease. Tenant hereby agrees not to look to the mortgagee, as mortgagee, mortgagee in possession, or successor in title to the property, for accountability for any security deposit required by Landlord hereunder, unless said sums have actually been received by said mortgagee as security for Tenant's performance of this lease.

IN WITNESS WHEREOF, the parties have executed this lease as of the day, month and year first above written.

Landlord: BVH Biddford, LLC

By: 
Name: Timothy Harrington
Title: Manager

Tenant: Orange Fitness

By: 
Name: Patrick Welch
Title: President

EXHIBIT A