BH2M

Engineering • Surveying • Environmental Solutions

Town of Falmouth Planning Office
271 Falmouth Road
Falmouth, Maine 04105

September 16, 2026

Re: Tidewater Village TV3 Development
Site Plan Application

Empire Development, LLC has engaged with BH2M to provide design and permitting assistance for a Site Plan application through the Town of Falmouth for development of an existing lot (Tax Map U52, Lot 6) along Clearwater Drive in Falmouth. This parcel has been identified as the "TV3" parcel as part of the Tidewater Village Master Planned Development zone.

Following up on our February 27, 2023 pre-application meeting and a Planning application from April 5, 2023, we are providing an update Site Plan application for the Planning Department's review. The project is also subject to the criteria provided in the Tidewater Village Design Guide, provided as Attachment G of this Site Plan application. These guidelines provide a specific review process under Section B, where the Tidewater Village Association would provide oversight of the design process. During the pre-application process, it was clarified that the Tidewater Village Association has not been formed. From the guidance we have received from the planning department, the review process and submissions for Section B are not applicable. The requirements of Section C 3.00 provide specific requirements for uses of the property, building configuration, and sizing, with responses to this section provided as Attachment F. These details have also been provided on the Site Plan, Sheet 1 as provided in this submission, and we find that the project is below these required maximum values for building footprint, height, and configuration.

We have advanced development of Civil Site Plans for the project. These plans include grading, parking areas meeting Town requirements, building layout, and drainage design. To address concerns raised by the Town's engineering department, a stormwater analysis has been conducted to estimate project stormwater impacts to the closed drainage system. These calculations show that post-development stormwater run off to the closed drainage system along Clearwater Drive will be reduced compared to existing conditions, and the capacity of this system will be maintained.

The project has also had a pre-application meeting with Maine DEP to discuss stormwater and environmental permitting. It was found that the project qualifies for a Stormwater Law permit, requiring Basic and General treatment of stormwater. The attached stormwater report identifies these requirements and has been designed in conformance with Maine DEP Chapter 500 stormwater rules. The project will also qualify for Maine DEP NRPA Tier 1 permitting. Per guidance from Maine DEP, this will require permitting of proposed wetland impacts, along with considering previous wetland impacts with construction of Clearwater Drive and a previously developed on-site parking area. Wetland impacts have been quantified on Sheet D of the plan set. These permits have been applied for on June 22, 2026, and physical copies of the applications have been provided to the Town of Falmouth. At this time, the project has been found complete for processing and is currently being reviewed by DEP. We are also working with Chris Baldwin at Cumberland County Soil and Water Conservation District for the Stormwater review aspects of the project. We expect to have final approval from DEP in October.

The project has also been in consultation with the Army Corps of Engineers on permitting wetland impacts associated with development of the project. Given that this is an isolated wetland that drains directly to a municipal closed drainage system (along Clearwater Drive), and that system also drains directly to a tidal area, the project is likely to be found as being non-jurisdictional for ACOE. ACOE performed a site walk on the project in May of this year and verbally confirmed that this is likely non-jurisdictional, but had not yet released the final findings. We will provide the Town with the final confirmation on the jurisdictional applicability once issued.

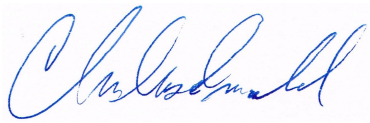
With the previous submission to the Town of Falmouth in April of 2023, we received comments that the application would not be found complete until the architecture details for the project could be provided. The project now is included building architectural and landscaping architectural plans and narratives for review by the Town, and this provides a comprehensive design for full Planning review.

In support of this permit application, we are providing a set of plans detailing proposed site conditions, and the following attachments:

Attachment A – Town of Falmouth Request for Hearing form
Attachment B – Town of Falmouth Site Plan Review Checklist
Attachment C – Town of Falmouth Site Plan Fee Calculation Sheet
Attachment D – Current deed showing Empire Development, LLC as the owner of the property.
Attachment E – Site Plan Code Review Response (Civil)
Attachment F – Site Plan Code Review Response (Landscape Architect)
Attachment G – Tidewater Village Design Guidelines
Attachment H – Tidewater Village Design Guideline Review Response (Civil)
Attachment I – Tidewater Village Design Guideline Review Response (Building Architect)
Attachment J – Tidewater Village Design Guideline Review Response (Landscape Architect)
Attachment K – Site Furniture Details
Attachment L – Light Fixture Cut Sheets
Attachment M – Stormwater Report

We trust that this application and supporting documents will facilitate Site Plan approval of the project. We look forward to answering any questions the Planning Department staff may have, and look forward to presenting these details to the Planning Board for preliminary approval.

Sincerely,



Christopher MacDonald, P.E.
Senior Project Engineer

cc. Michael Jacobson, Empire Development, LLC
King Weinstein, Empire Development, LLC

Attachment A
Town of Falmouth Request for Hearing form

FALMOUTH PLANNING BOARD REQUEST FOR HEARING

IN ADDITION TO THE SPECIFIED REVIEW FEES, APPLICATIONS SHALL BE ACCOMPANIED BY A $125.00 FEE TO COVER THE COST OF NOTIFICATIONS AND PUBLISHING.

Name of Applicant: Empire Development, LLC Phone# (207)781-2958 x 1

Full Address: 1 River Oaks Way Unit 1 Falmouth, ME 04105 Alt. Phone#

Map: U52 Lot: 6 Zone: Tidewater MPD E-Mail: jacobson@majre.me

Address of Property to be Developed: Clearwater Drive / TV3

Property Owner (if other): Same as Applicant

Full Address: Phone:

The undersigned requests that the Falmouth Planning Board consider the following application for:

Major Subdivision:

☐ **Pre-App Sketch Plan** ☐ **Preliminary Approval** ☐ **Final Approval** ☐ **Amendment** ☐ **Re-Approval**

Minor Subdivision:

☐ **Pre-App Sketch Plan** ☐ **Final Approval** ☐ **Amendment** ☐ **Re-Approval**

Site Plan Review:

☐ **Pre-App Sketch Plan** ☑ **Final Approval** ☐ **Amendment** ☐ **Re-Approval**

☐ **Private Way Approval/Amendment** ☐ **Fill Permit** ☐ **Sign Permit**

☐ **Shoreland Zone Permit** ☐ **Personal Wireless Service Facility** ☐ **(Tier I)** ☐ **(Tier I & II)**

☐ **Contract Zoning** ☐ **Other** (specify)

Notes to the Applicant:

1. A short description of the project must be attached to this form. This application must be filed at the Town Hall no later than twenty-eight (28) days prior to the regular meeting of the Board (1st Tuesday monthly). Applications shall be accompanied by all application fees and materials required by the applicable ordinance(s), checklists and fee schedule.
2. Applications shall include all materials and copies as specified on the Submittal Requirements form.
3. All materials in color shall be copied in color.

Application Authorization

I hereby make application to the Town of Falmouth for the above-referenced property(ies) and the development as described. To the best of my knowledge, the information provided herein is accurate and is in accordance with the Zoning and Subdivision Ordinances of the Town, except where waivers are requested. The Town of Falmouth Planning Board and/or town employees are authorized to enter the property(ies) for purposes of reviewing this proposal and for inspecting improvements as a result of an approval of this proposal. I understand that I am responsible for appearing, or having someone appear on my behalf, at all meetings before the Planning Board.

Unless the applicant has submitted notice to the Community Development Department as part of the initial and any subsequent submittals, no alteration of site conditions, including the existing landscape, structures and buildings, shall occur between the date of application submittal and the date the application has received final sign off from staff after Planning Board approval.

Signed: Michael A Jacobson Date: 8-19-2026

Printed name: Michael A Jacobson

Please identify yourself (check one): ☐ Agent* ☑ Property Owner

***(If you are an agent, written authorization from the property owner must be attached to this form.)**

Attachment B
Town of Falmouth Site Plan Review Checklist

SITE PLAN REVIEW CHECKLIST

NAME Tidewater Village TV3 Development **DATE** August 6, 2026

N/A: Not Applicable
X: Included in Submission
O: To be provided in subsequent submissions

_X_ 1. All applicable fees (see fee schedule)

_X_ 2. Fee Calculation Sheet

N/A 3. Negotiated Exactions Fees: In accordance with Section 19-135, exaction fees may be assessed against projects requiring site plan approval per the administrative procedure of Section 12 of the Falmouth Subdivision Ordinance (Section 19-128). [Adopted 1/22/90].

O 4. DEP approval, if required (Section 19-128). Stormwater Law and NRPA Tier 1 permitting is required for the project, and a copy has been previously provided to the Town of Falmouth.

N/A 5. Board of Zoning Appeals approval, if required (Section 19-131).

N/A 6. Subdivision approval, if required (Section 19-135).

_X_ 7. Plan sets in number and format as required (See Submittal Requirements form): (Section 19-128), and prepared in accordance with Section 19-128b.

- _X_ A. First floor plans.
- _O_ B. Building elevations showing proposed material and color.
- _X_ C. Site Plan at no less than 1"= 40' scale showing:
  - _X_ 1. Lot area and dimensions.
  - _X_ 2. Size, shape, and location of existing and proposed buildings.
  - _X_ 3. Location and layout of parking areas, parking spaces, and drives.
  - _X_ 4. Existing and proposed grades and drainage.
  - _X_ 5. Proposed sewer and water facilities.
  - _X_ 6. Landscaping plan (by Registered Landscape Architect), if required by the Town Planner.
  - N/A 7. Location of fences.
  - _O_ 8. Signs and advertising features.
  - N/A 9. Key map showing entire project and relation to surrounding properties and buildings.
  - _X_ 10. Proposed location of all existing and new utility services (Section 19-153d).

_X_ 8. General Site Plan Standards (Section 19-133).
- _X_ 1. Utilities underground (Section 19-133.d)
  - _X_ a. On-site
  - _X_ b. Off-site to main utility lines

_X_ 9. Performance Standards and Guidelines (Section 19-134).

- _X_ A. Environmental Considerations (Section 19-157).
  - _X_ 1. Maintenance of existing topography (Sec. 19-157 b (1)).
  - _X_ 2. Increase in rate of storm water runoff minimized (Sec. 19-158 b (2)).
  - _X_ 3. Full stormwater management plan if 10,000 sq. ft. of impervious surface (Subdivision Ordinance, Appendix 7-6).
  - _X_ 4. Post-Construction Stormwater Management Plan per Section 19-72A.
  - _X_ 5. Natural vegetation retained, protected, and supplemented (Section 19-158 b (3)).

- _X_ B. Parking Area Standards (Section 19-136)

  General Parking Requirements:
  - _X_ 1. Number of spaces for specific uses (Section 19-38 b).
  - N/A 2. Planning Board determination for unspecified uses (Section 19-38 c).

X 3. Parking space dimensions (Section 19-38 d and 19-136 e).
N/A 4. Parking to be located on site (Section 19-38 e).
____5. Joint use arrangements (Section 19-38 f). This section of the code is not provided online
____6. Parking area setbacks in residential districts (Section 19-38 g). This section of the code is not provided online

Parking Area Design Standards (Section 19-136)
X 1. Access to parking spaces (Section 19-136 a).
X 2. Size of aisles (section 19-136 b).
X 3. Parking within front setback (Section 19-136 c).
X 4. Sidewalk and curbing (Section 19-136 d).
X 5. Marking and delineation of parking area (Section 19-137).
X 6. General circulation and parking design guidelines (Section 19-138).
X 7. Snow removal and storage areas (Section 19-136 f).
N/A 8. Location of off-street loading berths (Section 19-39 and 19-136 c).

Parking Standards (section 19-140)
X 1. Location of entrances with respect to site distances and intersections (Section 19-140 a).
X 2. Limitations on curb cuts (Section 19-140 b).
X 3. Angles of driveways at road (Section 19-141).
X 4. Maximum and minimum driveway dimensions (Section 19-142).
X 5. Driveway surfacing (Section 19-143).
N/A 6. Driveway grades (Section 19-145).
N/A 7. Acceleration and deceleration lanes (Section 19-146 and 19-147).

X C. Lighting Design Section 19-149).
X 1. Lighting plan (Section 19-149).
X 2. Maximum height of freestanding lights (25') (Section 19-149 b).
X 3. Maximum apex angle of cone of illumination (150) (Section 19-149 c).
X 4. Lighting location requirements (Section 19-149 d-j, 1 & m).
X 5. Lighting intensities (Section 19-149 k).

N/A D. General Buffer Standards. (Section 19-150)
____1. Spacing of evergreens used as buffering (Section 19-150 a).
____2. Required locations of buffers (Section 19-150 b).
____3. Maintenance of natural buffers, if sufficient (Section 19-150 c).
____4. Fences and screening located within property lines to allow access and maintenance (Section 19-150 e & f).

N/A E. Special Buffer Standards (Note: These requirements apply only to site development within the specific zoning districts indicated).

BP Business Professional (Section 19-151).
SB-1 Suburban Business-1 (Section 19-152).
CO Corridor Overlay (Section 19-153).

____1. Plan prepared by Registered Landscape Architect (Section 19-128 a (3)).
____2. Minimum required plantings and buffers:
(BP Section 19-151 a)
(SB-1 Section 19-152 a)
(CO Section 19-153 a)
____3. Parking Area Landscaping (Section 19-154 a).
____4. Minimum plant sizes (Section 19-154 b).
____5. Required plant types (Section 19-154 b).
____6. Plant Maintenance Bond (Section 19-154 d).

N/A F. Drive Through Facilities (Section 19-148)
____1. Queuing & Circulation (Section 19-148 a).

____2. Pedestrian Safety (Section 19-148 b).
____3. Stacking & Queuing Requirements (Section 19-148 c).
____4. Circulation (Section 19-148 d).
____5. Separation Distances from Intersection (Section 19-148 e).

N/A 10. Master Development Plans - BP and CO Districts

____A. Business and Professional Zone Five Acre Site Plan (Section 19-157). Plan required if more than 5 acres owned by developer/landowner.
____1. No more than one entrance and exit on Route 1 (Section 19-157 a).
____2. Lots for future development indicated (Section 19-157 b).
____3. Facilities for future lots indicated (Section 19-157 b).
____4. Definition of lots to receive final approval (Section 19-157 c).

____B. Corridor Overlay Zone Master Development Plan (Section 19-17).
____1. Plan required if lot of 10 acres or 500' frontage on Route 100.
____2. Plan by landscape architect or engineer.
____3. Minimum required information.
____4. Proposed overall vehicular circulation system (road network).
____5. Development to be consistent with Master Plan.

N/A 11. Request waivers of performance standards with justification and proposed conditions (Sections 19-134).

O 12. DEP Maine Construction General Permit (MCGP)(Required if total soil disturbance exceeds 1-acre).

Attachment C

Town of Falmouth Site Plan Fee Calculation Sheet

Town of Falmouth
Planning Department
Site Plan Fee Calculation Sheet
Effective 05/12/2022

Map Lot Number	Map U52 Lot 6
Street Address	Clearwater Drive
Project Name	Tidewater Village TV3 Development
Gross Square Footage	Building Gross Square Footage = 45,585 sq.ft.
Applicant	Empire Development, LLC.

Publishing & Notice	$125.00 flat fee	125.00
Pre-application Sketch Plan Review	$250.00 flat fee	
Review Fee	$500.00 flat fee	$500
	$300.00/dwelling unit 28 x $300	$8,400
	Plus $50/1,000 sq ft-nonresidential $50 x 7,413 / 1000 sq.ft.	$370.65
Amendment (no additional building square footage)	$250.00 flat fee	
Re-approval	$250.00 flat fee (with no changes)	
Peer Review Escrow	$200.00/1,000 sq ft $200 x 45,585 / 1000 sq.ft.	$9,117
TOTAL FEES REQUIRED		$18,512.65

Note: If the application is also a subdivision, both Fee Calculation Sheets must be completed.

Review fees are not typically refundable. If extenuating circumstances occur, the Department may consider a partial or full refund.

Staff Use Only:
Approved by _____ Date _____

Attachment D
Current Deed

MAINE REAL ESTATE TAX-Paid

DLN: 1002240204292

QUITCLAIM DEED
(With Covenant)

KNOW ALL PERSONS BY THESE PRESENTS, that **EW LAND, LLC**, a Maine limited liability company (herein, "Grantor"), having a place of business in Portland, County of Cumberland and State of Maine, in consideration of One Dollar and other valuable consideration paid by **EMPIRE DEVELOPMENT LLC**, a Maine limited liability company having a place of business in Saco, Maine, and whose mailing address is 198 Saco Avenue, Old Orchard Beach, ME 04064, the receipt whereof is hereby acknowledged, does hereby REMISE, RELEASE, BARGAIN, SELL AND CONVEY and forever QUITCLAIM unto the said **EMPIRE DEVELOPMENT LLC**, its successors and assigns forever, certain real estate situated in the Town of Falmouth, County of Cumberland and State of Maine, said real estate being more particularly described as follows.

See Attached Exhibit A

TO HAVE AND TO HOLD, the same, together with all the privileges and appurtenances thereunto belonging, to the said **EMPIRE DEVELOPMENT LLC**, its successors and assigns forever, to their use and behoof forever.

AND Grantor **COVENANTS** with the said Grantee, its successors and assigns forever, that Grantor will **WARRANT AND FOREVER DEFEND** the premises to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons claiming by, through or under Grantor.

IN WITNESS WHEREOF, the said **EW LAND, LLC** has caused this instrument to be sealed with its seal and signed in its name by Richard E. Curran, Jr., its Manager, thereunto duly authorized, this 28th day of July, 2022.

Signed, Sealed and Delivered
In Presence of:

EW LAND, LLC

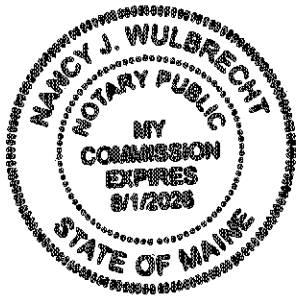
Witness

By: _____
Richard E. Curran, Jr.
Its Manager

STATE OF MAINE
CUMBERLAND, SS.

July 28, 2022

Personally appeared the above named Richard E. Curran, Jr., Manager of EW Land, LLC, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of the said EW Land, LLC.



Before me,

Nancy J. Wulbrecht
Notary Public/~~Attorney at Law~~

Exhibit A

A certain lot or parcel of land situated on the northwesterly side of Clearwater Drive shown as Lot TV3 and a certain fifty (50) foot private right of way located northwesterly of and adjacent to Lot TV3 on a Final Subdivision Plan of Tidewater Village prepared by DeLuca Hoffman Associates, Inc. dated March 2006 and revised through October 16, 2006, as recorded in the Cumberland County Registry of Deeds in Plan Book 206, Page 751;

Commencing at a southerly corner of land now or formerly of Tidewater, LLC as described in a deed dated October 14, 2005 and recorded in the Cumberland County Registry of Deeds in Book 23279, Page 222, and land now or formerly of The Emery-Waterhouse Company described in a deed dated October 30, 1968 and recorded in the said Registry of Deeds in Book 3064, Page 283;

Thence N 36° 12' 15" E a distance of 156.89 feet to the true point of beginning of the premises herein conveyed;

Thence along land now or formerly of Tidewater, LLC by the following courses and distances:

N 36 12'15" E a distance of 53.39 feet, crossing the northwesterly terminus of said fifty (50) foot private right of way; thence

N 36° 12' 15" E a distance of 149.93 feet;

N 14° 54' 39" W a distance of 51.38 feet;

N 36° 12' 15" E a distance of 235.00 feet to a point on the southerly side of Farm Gate Road;

Thence by the southerly side of Farm Gate Road by the following courses and distances:

S 43° 30' 38" E a distance of 40.65 feet;

S 43° 30' 38" E a distance of 59.21 feet;

Southeasterly along a curve to the left having a radius of 175.00 feet, an arc distance of 36.61 feet, said curve having a chord which bears S 49° 30' 12" E a distance of 36.54 feet;

S 55° 29' 45" E a distance of 174.38 feet;

Southerly along a curve to the right having a radius of 10.00 feet, an arc distance of 15.71 feet, said curve having a chord which bears S 10° 33' 41" E a distance of 14.14 feet to the northwesterly sideline of Clearwater Drive;

Thence S 34° 26' 19" W along said sideline of Clearwater Drive a distance of 355.95 feet;

Thence along Clearwater Drive by a curve to the right having a radius of 368.12 feet and an arc distance of 91.98 feet;

Thence S 48° 45' 19" W along said sideline of Clearwater Drive a distance of 76.30 feet, crossing its intersection with the aforementioned fifty (50) foot private right of way, to a point on the northeasterly sideline of land now or formerly of Clearwater II, LLC as described in a deed dated June 10, 2008 and recorded in the said Registry of Deeds in Book 26119, Page 226,

which point is at the intersection of Clearwater Drive with the southwesterly sideline of said right of way;

Thence along the said sideline of Clearwater II, LLC and the southwesterly sideline of said right of way northerly along a curve concave to the left having a radius of 10.00 feet, an arc distance of 15.63 feet, said curve having a chord which bears N 03° 57' 53" E a distance of 14.09 feet;

Thence N 40° 49' 32" W along said sideline of Clearwater II, LLC and land now or formerly of Tidewater Conservation Foundation as described in a deed dated December 21, 2006 and recorded in Book 24699, Page 62 following the southwesterly sideline of said right of way a distance of 218.16 feet;

Thence northwesterly along said Tidewater Conservation Foundation and said right of way, along a curve to the right having a radius of 175.00 feet, an arc distance of 23.12 feet, said curve having a chord which bears N 37° 02' 26" W a distance of 23.10 feet;

Thence along said Tidewater Conservation Foundation and said right of way N 33° 15' 20" W a distance of 24.39 feet to the true point of beginning.

Excepting and reserving rights of others over said right of way as set forth in an instrument dated October 12, 2005 and recorded in the said Registry of Deeds in Book 23279, Page 228

Together with the rights and easements as set forth in an Easement Deed from Tidewater, LLC to Emery-Waterhouse Company dated October 14, 2005 and recorded in the said Registry of Deeds in Book 23279, Page 233; including the right to designate and use a portion of the premises conveyed to Tidewater Conservation Foundation by deed dated December 21, 2006 and recorded in Book 24699, Page 62 for wetlands remediation as more fully set forth therein and subject to a sidewalk easement for the benefit of the Town of Falmouth dated May 5, 2008 and recorded in the said Registry of Deeds in Book 26030, Page 97, and subject to utility easements of record.

Meaning and intending to describe all the remaining property of Emery-Waterhouse Company on the northwesterly side of Clearwater Drive as described in a deed dated October 30, 1968 and recorded in said Registry of Deeds in Book 3064, Page 283 and also being all of the premises conveyed by Tidewater, LLC to Emery-Waterhouse Company by deed dated October 14, 2005 and recorded in the said Registry of Deeds in Book 23279, Page 231.

Also meaning and intending to describe a portion of the same property conveyed by The Emery-Waterhouse Company to EW Land, LLC by deed dated February 19, 2014 and recorded in the Cumberland County Registry of Deeds in Book 31342, Page 194, identified as Parcel III in the legal description attached to such deed.

DOC :39533 BK:39619 PG:252
RECEIVED - RECORDED, CUMBERLAND COUNTY REGISTER OF DEEDS
08/02/2022, 10:51:56A
Register of Deeds Jessica M. Spaulding E-RECORDED

The premises are conveyed subject to the rights of the Tenant under that certain Memorandum of Lease recorded in the Cumberland County Registry of Deeds in **Book 33086, Page 222**, and as assigned and assumed by an Assignment of Lease, dated December 19, 2019, recorded in said Registry in **Book 36276, Page 160**.

Attachment E
Site Plan Code Review Response (Civil)

Site Plan Code Review Response (Civil Engineering)

The below sections reference the Town of Falmouth Code of Ordinances for Site Plan Review. Each section of the code applicable to the project has been listed with a narrative of how this section is met, how it is applicable, or actions proposed to be taken.

Section 19-38-a&b: The project has been designed as a master planned development. Parking considerations were made to utilize both onsite and off-site parking to create a "village like" atmosphere. The project has been designed to provide adequate parking utilizing existing parking spots on and off site as well as providing additional proposed parking on site to meet the total required parking.

Section 19-38-c: Parking spaces are proposed to be 9' wide by 18' long minimum.

Section 19-38-d: Not applicable; project is located in a contract zone.

Section 19-38-e: Not applicable; project is not located in a retirement community overlay district.

Section 19-38-f&g: These sections of the code are not available through the Town's website.

Section 19-133-a: Existing landscaping will be preserved to the greatest practical extent. Given the planned development of this site, the majority of existing vegetation will be removed. A buffer along the northern side of the site for the Tidewater Farms project will remain in-tact and provide effective vegetative screening for the development of the TV3 parcel, as was the intent during development of Tidewater Farms.

Section 19-133-b: The TV3 parcel is subject to the Tidewater Village Design Guidelines as was developed as part of the contract zoning district for the parcel and surrounding properties. These guidelines have been established specifically to ensure a harmonious development of Tidewater Village.

Section 19-133-c: As part of the master plan for Tidewater Village, project entrances had previously been established. Internal circulation provides a logical path for traversing the site and negotiating parking areas

Section 19-133-d: Utilities have been provided as subs to the property line at the time of the original development of Clearwater Drive. The project proposes to use underground utilities based on these existing stubs.

Section 19-133-e: Advertising signage is not proposed as this time. Signage will be permitted individually through the Town of Falmouth by tenants of the commercial properties.

Section 19-133-f:	Dumpster areas are proposed to have a screened enclosure.
Section 19-133-g:	Not Applicable, project subject to the Tidewater Village Contract Zone.
Section 19-133-i:	Not Applicable, project subject to the Tidewater Village Contract Zone.
Section 19-133-j:	Not Applicable, project subject to the Tidewater Village Contract Zone.
Section 19-136-a:	Access has been designed to provide adequate space for parking and maneuvering around the site.
Section 19-136-b:	Typical parking spots are 9’ x 18’ with 25’ lanes and aisles.
Section 19-136-c:	Not applicable; contract zone does not require building setbacks.
Section 19-136-d:	The project proposes curbing and sidewalks for pedestrian navigation around the site, and provides a safe means of egress.
Section 19-136-e:	Not applicable; no compact car spaces are proposed.
Section 19-136-f:	Plans show means for snow storage meeting these requirements.
Section 19-137:	Plans provide striping locations for proposed parking areas and cross walks.
Section 19-138-a:	Parking is intended to be utilized by the multiple uses for the property and parking has been centrally located for these uses. The project proposes on-site parking as well as utilizing existing parking along Clearwater Drive and the existing on-site parking areas to exceed the Town’s parking requirements.
Section 19-138-b:	Parking has been established as part of the master plan for Tidewater Village.
Section 19-138-c:	Crosswalks have been provided as applicable. Raised crosswalks would provide an impediment to drainage and are not proposed for this development.
Section 19-138-d:	The project appears to meet this requirement for driveways.
Section 19-138-e:	Given the configuration of the property and master plan of development for the parcel, two-way entrances are proposed.
Section 19-138-e:	Bus traffic is not proposed for this project.
Section 19-139:	The project proposes to exceed parking requirements for the proposed uses. No waivers are requested at this time.

Section 19-140: The project is being developed per a master plan. The project proposes to use existing curb cuts that were designed and constructed as part of the development of Clearwater Drive.

Section 19-141: Driveways have been established perpendicular to the streets they access.

Section 19-142: Driveways will utilize the existing 24-foot-wide entrances.

Section 19-143: Driveways and parking areas are proposed to have a paved finished condition.

Section 19-144: Driveways will provide smooth transitions.

Section 19-145: Driveway grades will not be in excess of 5%.

Section 19-146: Not applicable; the project proposes less than 200 parking spaces, and acceleration lanes are not required.

Section 19-147: Not applicable; the project proposes less than 200 parking spaces, and deceleration lanes are not required.

Section 19-148: Not applicable; drive-through facilities are not proposed.

Section 19-149: A lighting plan has been provided for this submission

Section 19-150: The general buffer standards do not apply to this project. The project has been designed per the Tidewater Village Design Guidelines and per a master plan development. The project is surrounded by commercial uses designed to have a "village" feel, and screening is not applicable. Screening from residential properties in the Tidewater Farm development has been previously planned for with a reserved strip of vegetation along the north of the project. There will be adequate screening from residential uses.

Attachment F

Site Plan Code Review Response (Landscape Architect)

Effective on: 12/9/2013

Sec. 19-149 Lighting Design Standards:

In connection with every site plan, the applicant shall submit plans for all proposed exterior lighting. These plans shall include the location, type of light, radius of illumination, manufacturer's specification sheet and the intensity in footcandles. The following design standards shall be followed:

a. The style of the light and light standard shall be consistent with the architectural style of the principal building.

- **The proposed fixtures for the project are similar to fixtures along Clearwater Drive and adjacent uses. Building mounted fixtures at main entry match pole fixture. Emergency fixtures and residential deck lights will be wall-pac or recessed fixtures.**

b. The maximum height of freestanding lights shall be the same as the principal building but not exceeding twenty-five (25) feet, except as restricted in Section 19-11 for lights in the VC Districts.

- **Pole mounted fixtures will be 16-foot pole on** concrete light pole base with 12-inch exposure.

b. All lights shall be shielded to restrict the maximum apex angle of the cone of illumination to one hundred fifty (150) degrees.

- **Fixtures are full cut off or recessed fixtures.**

d. Where lights along property lines will be visible to adjacent residents, the lights shall be appropriately shielded.

- **Not applicable.**

e. Spotlight-type fixtures attached to buildings shall be avoided.

- **Not applicable.**

f. Freestanding lights shall be located and protected to avoid being easily damaged by vehicles.

- **Fixtures will be on concrete light pole base, base height above grade in landscape areas will be 12 inches HT.**

g. Lighting shall be located along streets, parking areas, at intersections and crosswalks and where various types of circulation systems merge, intersect or split.

- **There are existing street light fixtures along Clearwater Drive and adjacent side streets. The internal lighting is provided within the parking area and along pedestrian activity areas.**

h. Stairways and sloping or rising paths, building entrances and exits require illumination.

- **Not applicable.**

i. Pathways, sidewalks and trails shall be lighted with pedestrian scaled lighting. The maximum height of pedestrian freestanding lights is 12 feet.

- **One pole mounted pedestrian fixture at main entry will be 11 FT with base.**

j. Light posts shall be installed so that the pillar bases are flush with the ground except for lighting located without a landscaping island in parking lots, where pillar bases may be a maximum of one foot in height.

- **Due to potential for plowing impacts and grounds maintenance the applicant is requesting a minimum base height of 12 inches.**

k. Lighting shall be provided where buildings are set back or offset.

- **Lighting on buildings will be limited to deck lights for residential units, recessed canopy fixtures for retail.**

l. Illumination levels shall meet the following intensity in footcandles:

1. Parking lots: an average of one and one-half (1.5) footcandles throughout.
    - **Front parking 1.60 FC (proposed) rear parking, (existing) 1.66 FC.**
2. Intersections: three (3) footcandles.
    - **Entry lighting level at Clearwater Drive are not quantified as existing roadway light fixture data was unavailable.**
3. Maximum at property lines: one (1.0) footcandle.
    - **Does not exceed 1.0 FC.**
4. In residential areas: average of six-tenths (0.6) footcandle.
    - **Not applicable.**

m. Display lighting shall be shielded and located and maintained so as not to create or constitute a hazard or nuisance to the traveling public or to neighbors. String lights shall not be permitted.

- **Not applicable.**

n. Parking area lighting shall be shielded and located and maintained so as not to create or constitute a hazard or nuisance to the traveling public or to neighbors.

- **Fixtures are located primarily within the interior parking lot, the parking lot is screened by the proposed building and retained and proposed vegetation. The should be no impact upon Clearwater Drive or the two side roads.**

o. Fuel Pumps and Canopies

1. Lighting levels for canopies shall be adequate only to facilitate the activities taking place in such locations and shall not be used to attract attention to the business. Under canopy lighting shall be designed to provide an average level of illumination not to Page 176 of 204 exceed 20-foot candles with a maximum foot-candle reading beneath the canopy not exceeding 30 foot-candles, with a uniformity ratio of 1.25 (average to minimum).

- **Not applicable.**

2. Light fixtures mounted on canopies shall be recessed so that the lens cover is recessed or flush with the bottom surface (ceiling) of the canopy and are shielded by the fixture or the edge of the canopy so that light is restrained to no more than 85 degrees from vertical.

- **Not applicable.**

3. Lights shall not be mounted on the sides (fascia) or top of the canopy and the sides (fascia) shall not be illuminated except as permitted in conjunction with permitted signs.

- **Not applicable.**

Effective on: 12/9/2013

Sec. 19-150 General Buffer Standards;

Buffers are fences, landscaping, berms and mounds used to minimize any adverse impacts or nuisances on the site or from adjacent areas. Development in the VC Districts is exempt from this section. The following guidelines apply:

a. Evergreens can be used as buffers, provided they are planted properly. An evergreen buffer requires six to eight (6-8) foot evergreen trees planted in an alternate pattern, five (5) feet on center.

b. Buffers shall be considered in or for the following areas and purposes:

1. Along property lines, to shield various uses from each other.

- **The proposed mixed residential and commercial building will have a perimeter landscape plan to provide a transition between the sidewalk and the building.**

2. Along interior roads running parallel to roads exterior to the site, to prevent confusion, particularly at night.

- **There are no interior roads, only parking lot travel lanes that do not run along roads.**

3. To totally screen garbage collection areas, loading and unloading areas, electrical transformers, air conditioning units, utility service areas, outdoor storage areas, and similar functions from public area. [Adopted 4/27/87]

- **Trash enclosure will be provided to screen the units and plantings have been added; transformers will be screened once the final location is determined.**

4. To block prevailing wind patterns and to stop wind-borne debris from leaving the site.

- **The building configuration and retained vegetation will provide a wind buffer.**

5. To screen parking areas, car lots, auto storage facilities, and other outdoor storage of motor vehicles from the public view with berms four (4) feet in height. A lower height, not less than three (3) feet, may be used as necessary to ensure that berms and/or plantings do not obstruct the visibility required for traffic safety. Additional screening shall be provided with plantings which shall be located so as not to obstruct the visibility required for traffic safety. [Adopted 4/27/87]

- **The parking area is internal and screened from adjacent roads and retained and supplemental planting will provide a screen for parking.**

c. Natural features shall be maintained wherever possible to provide a buffer between the proposed development and non-compatible abutting properties and public roadways. When natural features such as topography, gullies, stands of trees, shrubbery, rock outcrops do not exist or are insufficient to provide a buffer, other kinds of buffers shall be considered.

- **Existing vegetation will be retained where feasible.**

d. Buffers shall be sufficient to shield structures and uses from the view of non-compatible abutting properties and public roadways, and to otherwise prevent any nuisances including but not limited to all loading and unloading operations, storage areas, commercial vehicle parking, waste disposal and collection areas.

- **The proposed development will be well integrated into adjacent uses.**

e. Fencing and screening shall be durable and properly maintained at all times by the owner.

- **No fencing along the perimeter is proposed, several small private court areas will be provided with a decorative style of fence.**

f. Fencing and screening shall be so located within the property line to allow access for maintenance on both sides without intruding upon abutting properties.

- **Not applicable.**

g. All buffer areas shall be maintained in a neat and sanitary condition by the owner.

- **The owner will maintain the property as required.**

Effective on: 12/9/2013

Sec. 19-154 Other Landscaping Requirements:

a. Parking Area Landscaping. In addition to all other requirements, landscaping shall be required in all districts on any site where the aggregate required off-street parking or storage of motor vehicles exceeds ten (10) parking spaces. For each twenty-four (24) parking spaces there shall be required, adjacent to the parking spaces or within the parking lot, three (3) canopy trees, two (2) understory trees, and ten (10) shrubs.

- **The proposed expanded parking includes an adequate number of canopy and understory trees. Shrubs along the access drive and perimeter of the new**

parking address the required number of shrubs. There are 19 new spaces proposed that connect to the existing 49 space parking lot. New canopy, understory tress and shrubs have been provided. The existing parking has existing canopy trees as well as existing retained vegetation that meets the requirements.

b. Minimum Plant Sizes. Unless otherwise specifically indicated by the Planning Board, all plant materials shall meet the following minimum size standards:

- **Minimum Size**

Plant Material Type	Planting in buffer area abutting vacant land	All other Plantings
Canopy Tree, Single Stem	1 1/2 inch caliper	2 1/2 inch caliper
Multi-Stem Clump	6 feet (height)	10 feet (height)
Understory Tree	4 feet (height)	1 1/2 inch caliper
Evergreen Tree	3 feet (height)	5-7 feet (height)
Shrub Deciduous	15 inches (height)	24 inches (height)
Evergreen	12 inches (height)	18 inches (height)

- **Plant material meets or exceeds minimum requirements.**

c. Required Plant Types. All plantings required under this Ordinance shall be of a type and species appropriate for the soil types and climatic conditions in Falmouth as determined by the permitting authority. Invasive species of plants are prohibited. [Amended 5/13/13; 8/26/13]

- **All plant material has been selected to be compatible with climate zone and native and non-invasive planting.**

d. Plant Maintenance Requirements. The owner of any premises approved by the permitting authority under any section of this Ordinance shall have a continuing obligation to maintain Page 179 of 204 required plantings in accordance with the terms of the site plan approval and in a good and healthy condition.

- **The property owner agrees to maintain the property and vegetation in accordance with Site Plan approval.**

Attachment G
Tidewater Village Design Guidelines



TIDEWATER VILLAGE DESIGN GUIDELINES
FALMOUTH, MAINE

August 2005

ARCHETYPE architects 48 Union Wharf, Portland, ME (207) 772-6022

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SECTION A - UNIVERSAL DEVELOPMENT GUIDELINES

A1.00 Development Overview

The Tidewater Master Planned Development District creates a new neighborhood in Falmouth, connecting Clearwater Drive to the Presumpscot River basin and Casco Bay *(fig 3.1)*. The purpose of the District is to allow the development of the Tidewater area into a high quality, mixed-use commercial-residential neighborhood while preserving a significant portion of the land as open space, including much of the historic Tidewater Farm. The range of development echoes the historic settlement pattern of saltwater farm to residential village to commercial center through escalating density and scale. This transition is defined by two distinct components of the neighborhood, Tidewater Farm and Tidewater Village; open space and greenbelts establish connection points and definition between these areas *(fig 3.2)*. The Village area includes four distinct development parcels (designated as TV1 through TV4) with frontage on Clearwater Drive identified on the master development plan *(fig 3.3)*. The farm area includes three distinct development parcels (designated as TF1 through TF3)and residential neighborhood of 50 homes. Separate design guidelines specific to Tidewater Farm will guide the residential development on the farm, in keeping with its rural character but also maintaining a consistent design and materials language with Tidewater Village Design Guidelines.

The purpose of the Tidewater Village Design Guidelines is to establish the spatial and visual intent for commercial building and site development throughout the Tidewater Master Planned Development District and high-density residential development within the Village. The guidelines are designed to permit maximum creativity in site design and to ensure high quality construction with special attention to landscaping, lighting, building orientation and form, coordination of architecture, and signage.

Section A of these guidelines provides a consistent design vocabulary for common elements assignable to all four commercial development parcels, TV1 through TV4. All potential commercial and residential projects within the Tidewater Village portion of the Tidewater Master Planned Development District will be subject to the Development Review Process outlined in Section B. Section C addresses parcel-specific development components.

A1.01 Applicable Ordinances and Codes - All commercial design and development within the District shall comply with current applicable local, state and federal ordinances and codes.

A1.02 Americans with Disabilities Act (ADA) - All components of the District shall be designed to provide accessibility in accordance with current ADA guidelines. The design intent for the district acknowledges the visual texture achieved through varied entry and walkway conditions; site and building planning shall seek to incorporate ramps and accessible features as integral design components. *(fig 9.1)*.

A2.00 Circulation Systems

A2.01 General Circulation Guidelines - The integration of various modes of transportation is a significant component in the planning success of the overall District. Non-automotive traffic into the neighborhood from adjacent public, retail and residential areas is encouraged through the creation of appropriate systems, spaces and material selection.



fig 3.1: Tidewater Vicinity Map



fig 3.2: Tidewater Development District



fig 3.3: Tidewater Village

A2.02 Pedestrian Circulation - The District is interconnected with a series of pedestrian walkways and sidewalks of varying widths and materials. Walkways define open space areas, connect buildings, and create multiple routes to a given point. The master plan outlines basic walkway areas; development within each parcel should explore parcel-specific path systems to engage public spaces and reduce the desire for shortcut paths. Pedestrian walkway design and materials shall comply with Section A3.04 Paving and Curbing.

A2.03 Vehicular Circulation - Clearwater Drive constitutes the primary vehicular circulation path for the neighborhood, connecting directly to US Route 1. Secondary streets, drives, and accessways to and from Clearwater Drive are identified on the District master plan.

Traffic calming along Clearwater Drive may include material, texture, and/or color changes in the roadway, an activated street edge, and on-street parking *(fig 4.1)*.

Vehicular movement patterns in the District and within each development parcel shall be designed to minimize the need for wayfinding signage, and to discourage the use of linked parking areas for through traffic. The crossing of vehicle and pedestrian paths shall be kept to a minimum in all parcels. Separate or parallel routes for pedestrians and vehicles, especially delivery vehicles, utilizing a minimum number of crossings create safer conditions for all *(figs 4.2, 4.3, 4.4)*.

Bicycle traffic is supported throughout the district and bicyclists should be encouraged to travel on paved roadways and drives through the use of appropriate travel and turning lanes designated by color and/or material. Public areas and buildings shall be provided with exterior or interior bicycle storage racks; rack locations visible near access ramps discourages bicycle traffic on the sidewalk and minimizes bicycle/ pedestrian conflicts.



fig 4.1: Active Street Edge



fig 4.2: Pedestrian Crossing and Shared, Connected Parking



fig 4.3: Separate Pedestrian Crossing and Sidewalk Leading Away from Wide Intersection



fig 4.4: Pedestrian Crossing and Connecting Parking

A2.04 Parking Areas - Primary commercial and long-term automobile parking is provided through a series of parking areas serving each development parcel. Large parking areas shall be broken into smaller lots through the use of landscape buffers; these lots in turn should be visually reduced by tree placement and landscaped islands. All parking areas shall be designed to meet the standards of the Town of Falmouth Zoning and Site Plan Review Ordinances.

A Designated pedestrian walkways in parking areas should allow sufficient clear width between overhanging automobile bumpers *(fig 5.1)*.

B Shared parking for multi-tenant development is encouraged to reduce overall parking load and minimize impervious surfaces *(figs 4.2,4.4)*.

C Parking areas shall be screened from streets, buildings, and public open space by landscape buffers including berms, trees, shrubs and walls to provide visual separation during all seasons. Parking should be integrated into the natural or planted landscape *(figs 5.2,5.3)*.

D Parking areas shall be designed to accommodate snow storage and/or removal areas away from primary vehicle circulation and visual axes.

A2.05 On-Street Parking - Primary retail and short-term automobile parking is provided through head-in parking stalls along Clearwater Drive. Stalls should be sized and delineated according to the standards of the Town of Falmouth Zoning and Site Plan Review Ordinances.

A A raised walkway section should be provided to ensure that overhanging bumpers do not limit passage and activity along the sidewalk. *(fig 5.1)*.

A2.06 Service Areas - Service areas shall not face streets or public open spaces, and shall be located at the side or rear of buildings. Development within each parcel shall provide suitable access and circulation for smaller single-body trucks, and common service areas are encouraged where large truck access is required.

A Remote service areas are encouraged given the building footprint of the parcels and residential occupancy in parcels TV2 and TV3 *(fig 11.3)*.

B Service areas shall be sheltered and/or screened with complementary architectural elements or landscape buffers to minimize visibility from adjacent properties and public ways *(figs 11.2,11.3)*. Building materials may consist of high quality wood fencing and gates, natural or painted, or masonry or cast-in-place concrete walls with exterior veneer to match architectural features of primary building. Chainlink, metal, wire, PVC, or wood stockade fencing is discouraged *(figs 11.4,11.5)*. See also Section 5.07 in these Guidelines

C Service drives shall be discouraged from crossing pedestrian pathways; where unavoidable these areas shall provide ample sight distances and should be designed to pedestrian crosswalk standards noted in these Guidelines.



fig 5.1: Sidewalk Buffer for Vehicle Overhang



figs 5.2 & 5.3: Parking Integration into Natural Landscape; Stormwater Bioretention



A3.00 Sidewalks / Street Furnishings

A3.01 Outdoor Public Spaces - The District master plan illustrates a number of outdoor spaces for programmed and unprogrammed activity. These include interstitial spaces between building areas *(figs 6.1, 6.2)*, and courtyards. Outdoor spaces should be linked to longer pedestrian pathway systems, forming start and stop destinations to encourage pathway use *(figs 6.1 thru 6.5)*.

A The design vocabulary and material palette for outdoor public spaces shall be consistent throughout the District and should complement adjacent architecture and landscape architecture design.

B. With creative and coordinated use of paving materials, public gathering areas, sidewalks, and waiting areas can be designed to have a unique style that could and should be replicated throughout the Village.

Acceptable materials and treatments:
1. Granite
2. Clay (brick)
3. Concrete or granite unit pavers
4. Formed, finished concrete
5. Bituminous concrete (asphalt)
6. Concrete pigmentation and scoring to develop broad patterns, direct movement and separation.

Unacceptable materials and techniques:
1. Exposed aggregate
2. Loose rock, gravel in primary walks

A3.02 Outdoor Retail Activity - Exterior space adjacent to retail and food service occupancies should be designed to accommodate the extension of these businesses in fair weather. Ideally these areas shall be visible from primary outdoor public spaces *(fig 6.2)*.

A Changes in sidewalk material can delineate exterior seating areas in front of food service establishments. Additional walkway width should be provided to ensure that tables and chairs do not restrict regular pedestrian traffic.

B Building canopies provide cover and definition for sidewalk sales activity.





figs 6.3 & 6.4: Space for Formal Events

fig 6.1: Small Public Plaza





fig 6.2 Interstitial Space Between Buildings



fig 6.5: Outdoor Room

A3.03 Street Furnishings - A comprehensive system of street furnishings shall be incorporated into all development parcels. Street furnishings include railings, bicycle racks, bollards, trash receptacles, benches, planters, etc.

A The design vocabulary and material palette for street furnishings shall be consistent throughout the District and should complement adjacent architecture and landscape architecture design *(figs 7.1, 7.2)*.

B Materials must be durable and be able to withstand the rigors of heavy public use and Maine climatic conditions. Acceptable materials include heavy-gauge aluminum, galvanized steel, cast or wrought iron, granite and stone. Bench slats and decking may be recycled plastic/synthetic wood fiber *(fig 7.4)*. Extensive use of wood is discouraged, as well as use of "old style" park benches with wood slats and formed concrete supports.

C All street furnishings shall be secured to imbedded footings, not surface mounted or freestanding.

D Where possible, building and site designs are encouraged to directly incorporate street furnishing needs to provide a visually integrated streetscape. Canopies for public telephones and transportation waiting areas can readily be designed as exterior building components.

A3.04 Paving and Curbing - Sidewalk paving and curbing materials shall be consistent throughout the Village, shall complement adjacent architecture, and in all cases shall be distinct from roadway and parking lot paving materials *(figs 4.2,4.4,5.3)*.

A Sidewalks and ramps in all areas shall meet the current standards of ADA accessibility.

B Sidewalk materials shall vary to provide visual and tactile awareness of transition between areas of significant use and scale change.

C Curbing materials shall be granite or precast concrete set vertically or sloped to best suit the specific site condition. Curb sections shall be set flush to street pavement surface at ramp transitions.

A3.05 Street & Parking Crossings - Street crossing materials shall be visually and texturally distinct from roadway and parking lot paving materials to clearly delineate crossing areas in all seasons.

A The use of bollards and exaggerated curbing can denote crossing areas without additional signage *(fig 7.5)*.

B Unit pavers edged with granite bands may be used to delineate crosswalks in lower traffic areas (parking lots), but may not be used in street rights-of-way; in those instances, paver crossings may be mixed with white-painted borders and solid-painted infill *(fig 4.2)*. Pavement stamping or imprinting is not a durable treatment and is therefore not recommended for use.



figs 7.1 & 7.2 : Integrated Materials



figs 7.3 & 7.4 : Coordinated Materials





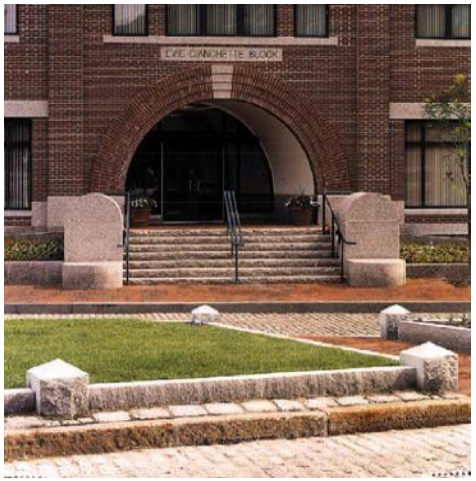


fig 7.5: Material Variety at Street Crossing

A4.00 Landscape Architecture

A4.01 Master Landscape Plan - An overall master landscape plan will be developed for the District by the project Landscape Architect identifying plant palettes, site amenities, furnishings, site lighting, and irrigation systems for common areas. Complementing the overall architectural design intent developed from regional vernacular context, the proposed landscaping will consist primarily of native plant material.

The master plan shall correspond to the overall Tidewater Master Planned Development District to ensure coordination of development buffers, sight lines, and utility systems. The master plan will include specific landscape requirements for each development parcel. Public open spaces will be defined on the plan, particularly public spaces in TV2 and TV3.

A4.02 Parcel Landscape Plan - Development proposals within each parcel shall include parcel landscape plans as described in Section B of these guidelines. Refer to Sec. 19-154 ~~9.28~~ of Falmouth Zoning Ordinance for Landscaping Standards.

A Detailed landscaping of parking areas and building parcels should respond to and be consistent with the Master Landscape Plan developed for the common areas and buffers.

B Plant material selection should strive to include plants with year-round interest combined with plants with seasonal change. Written schedule and species selection for annual flower bed replantings should be included in the submission.

C Placement of Tree Material - Various species shall be recommended for specific applications: salt-tolerant species within parking areas, minimum six (6) feet of clear trunk on trees with pedestrian or vehicular passage beneath, broad canopy trees at major public open spaces, and dense and/or non-deciduous species for screening and buffering use. Trees adjacent to buildings shall be coordinated with building design, incorporated into storefront canopy/ awning, signage, and lighting systems *(fig 8.1)*.

D Existing Trees - Every proposed site plan shall identify existing mature trees within the impacted development area. Provide a written management plan outlining trees proposed for removal and protection measures to safeguard remaining trees during construction.

A4.03 Maintenance and Replanting - Refer to Sec. 19-70 of Falmouth Zoning Ordinance for ongoing maintenance and replacement requirements. A monthly fee will be assessed to each parcel owner for landscape maintenance, snow removal, etc.

A4.04 Site Walls / Fencing - Site walls and fencing may be used to delineate exterior spaces, to provide planting and screening opportunities, and enhance building and parking area entries and separation. In all cases wall and/or fence material shall be complementary with adjacent buildings *(figs 8.2,8.3)*.

Proposed walls and fencing shall be identified on the landscape plan submitted with all development proposals as noted in Section B of these guidelines.



fig 8.1: Coordination of Trees and Facade



fig 8.2: Pocket Park with Screen Fence, Seating, Pavement Differentiation, Seasonal Interest



fig 8.3: Unbeveled Segmental Retaining Wall (SRW)

A5.00 Architecture

A5.01 General Design Intent - All parcels within the District shall be developed with a universal architectural narrative based on local and regional vernacular design elements. The intent is not to recreate historic buildings; rather to create designs that respond to the greater Falmouth community scale and aesthetic.

A5.02 Massing - Building area and footprint limitations are noted within each development parcel description of these guidelines. The relatively small footprint allowances dictate multilevel buildings that can be joined by linking volumes to create larger contiguous floor areas *(fig 19.2)*.

A Primary building massing shall be developed as simple rectilinear shapes *(figs 10.2,10.3)*. Triangular spaces, angled walls, or shallow curves may be acceptable, but use of complex shapes, such as hexagons, octagons or cylinders are difficult to successfully integrate and are not acceptable *(figs 9.2,9.3)*.

B Secondary massing shall be developed as additive volumes to the primary massing.

C Recessive or subtractive massing shall be permitted at ground floor levels only.

D Vertical elements such as towers and chimneys shall be permitted provided they are integral and subordinate elements of the primary building massing *(fig 10.2)*.

A5.03 Facades / Fenestration - Primary facades shall address streets and outdoor public spaces. Additional and/or unique frontage conditions are noted within each development parcel description in these guidelines.

Facade rhythms of solid and void shall follow the overall architectural intent of responding to local vernacular patterns and should reflect multiuse building programs where applicable.

Fenestration shall respond to the scale and proportion of exterior facades and interior plan arrangements. Primary fenestration systems shall include fixed and operable windows, and storefront / entry systems. Skylights and skylight systems shall not be used on any roof plane exposed to view from streets, public spaces, or adjacent buildings. Window material shall be complementary to the overall facade material on any given facade and/or building.

A5.04 Exterior Materials and Colors - The visual palette for the District shall represent a broad range of materials and colors within the overall context of regional vernacular design. Black, whites, stone-grays, brick red, and some natural pastel tones may be used; bright or fluorescent hues are unacceptable *(fig 9.3)*. The use of multiple materials and colors on individual buildings is highly encouraged. The use of brick and clapboard are favored as their use reflects regional historic building materials, linking past to present and future without forced re-creation of historic architecture nor design of contemporary structures using wholly synthetic materials *(fig 19.1)*.

Material changes can designate individual floor levels, primary versus secondary elevations, transitions in plane, or highlight building volumes. Primary materials may include, but are not limited to, the following categories:

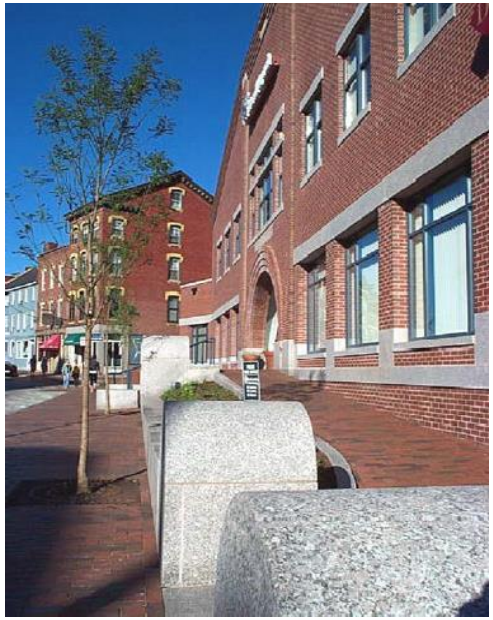


fig 9.1: Integrated ADA access





figs 9.2 & 9.3: Inappropriate Structure Forms

A Masonry - Masonry systems may include red brick or stone veneer using native New England species. Precast concrete or simulated granite may be used for columns, sills, lintels, accents, and/or wall base *(fig 10.1)*. In all cases mortar color shall be appropriately colored for its specific application. Glass block masonry and concrete masonry units shall be prohibited as finish exterior materials.

B Wood - Wood materials may include clapboards, horizontal and/or vertical siding, and shingles. Clapboards of cementitious composites may be acceptable for use; commercial grade vinyl is discouraged. Clapboard colors must complement adjacent materials and be white or natural in tone.

C Metal - Metal may be used for flashings, accents, and trim applications. The use of metal as a primary facade material is discouraged and shall be limited to raised seam systems and natural metal finishes.

D Glass - Glass systems shall not be used as a primary facade material.

A5.05 Roofs and Dormers - Roof design shall be appropriate for each specific building and shall respond to the regional vernacular overall design intent for the District. The visual goals for the District include the creation of a diverse architectural character, not a uniform expression in each parcel. Roof design shall respond to the following guidelines:

A Roof profile and slope - Gable and gambrel roof profiles are encouraged for primary building volumes. Hip roof profiles are generally discouraged and shall not be permitted in development parcels TV2 and TV3 except for accessory structures. Flat roof systems shall not be used where the roof is visible from streets, public spaces, or other buildings. Monopitch shed roofs shall not be used for primary volumes. The minimum pitch of any sloped roof plan shall be 6:12.

B Roof material - Sloped roofs may be finished in slate or commercial grade architectural asphalt shingles, and standing seam or flat seam metal systems. Snap-lock metal systems shall be prohibited. Membrane roofs may be used for flat roof systems in conditions noted above.

C Roof Accessories shall be appropriate for the overall roof design and material and shall complement and integrate with the building design *(fig 10.1)*. Roof accessories include vent systems, cupolas, snow guard and rail systems, gutters and downspouts.

D Dormers - The use of dormers shall be encouraged to allow habitable and/or support spaces under sloped roof areas, and to provide scale and rhythm to roof planes. Dormer design shall be appropriate to respective roof and building types with gable and shed profiles encouraged. Dormer roof materials shall follow the same guidelines noted above for primary roofs.

E Maximum Building Height - All buildings within the District shall be limited to a maximum of three (3) stories. This requirement shall not apply to towers, spires, and similar architectural features. The maximum height of such features shall be sixty (60) feet.



fig 10.1: Effective use of materials & detailing. Inappropriate scale and use of ventilation cupola & railing.



fig 10.2: Adjacent Building Relationship



fig 10.3: Freestanding Building & Differentiated Materials

A5.06 Utility Meters / Connections - No utility connection shall be exposed to view from streets, public spaces and adjacent buildings *(fig 11.1)*. Utility connections, meters and submeters, shall be installed in interior locations of all buildings in development parcels TV2 and TV3.

A Fire Suppression - All mandated fire suppression connections required to be readily visible shall be designed as an integral complementary element of their respective facades. All Knox box systems shall be fully recessed.

B Utility Venting - All utility venting, exhaust, and discharge equipment and piping shall be installed out of view from streets.

C Backflow prevention systems shall be installed in interior locations of buildings or in underground vaults, protected from frost and freezing.

A5.07 Trash/Service Enclosures - High quality wood fencing with galvanized steel support, black or white polyvinyl fencing or masonry veneer walls or combination of masonry columns and fencing, minimum six (6) feet in height, may be used to screen service areas from public view. Gates must be used if accessway cannot be oriented away from direct public view *(fig 11.2)*. Materials must complement building materials in form and color *(fig 11.5)*. Landscaping may enhance built enclosure.

A6.00 Lighting Systems

A6.01 General Design Intent - Lighting guidelines direct general area site lighting, accent lighting, exterior building light systems, and seasonal lights. Lighting specific to signage installations is addressed in Section A7.04 of these guidelines.

The overall lighting design shall provide for safe, inviting lighting conditions that encourage pedestrian activity during all seasons. Light levels and fixtures shall be considered an integral component of the architecture and landscape architecture within the District, and shall comply with current Town of Falmouth ordinances and IESNA standards as applicable.

Each development proposal shall include a lighting plan outlining all exterior lighting systems and fixtures. The proposal shall identify fixture and lamp types, mounting method and heights, photometrics, and a written narrative of overall lighting application, energy conservation systems, and controls.

To ensure design conformity with the overall Village intent, light fixtures common to all development parcels shall be as specified in the Tidewater Village Master Landscape Plan, including roadway, parking area, and sidewalk / walkway applications.

A6.02 Roadways / Parking Areas - Primary area lighting shall use cutoff fixtures to minimize glare and light spill onto adjacent properties. Additionally, lighting in these areas shall address the following standards:







figs 11.1,2,3: Suitable Consolidation, Placement & Enclosures

fig 11.4: Inferior Material Quality & Screening





fig 11.5; Suitable Screening, Uncoordinated Materials

A Fixture Heights - Maximum fixture mounting heights shall be as follows:
Roadways - 16 feet.
Parking Areas - 16 feet in development parcels TV1, TV2, and TV3; 20 feet in TV4.

B Location / Bases - Light poles serving open parking areas should be set in landscape islands and buffers to reduce damage from traffic and maintenance vehicles. Light pole bases adjacent to walkways shall be raised no more than six (6) inches above finish grade. Raised bases located along streets and in parking lots shall have a maximum above-grade exposure of no more than 24 inches. Exposed concrete shall not be painted.

C Accessory Mounting - Roadway light poles shall include accessory mounting brackets allowing for banners and street signage *(fig 12.1)*.

A6.03 Sidewalks / Walkways - Lighting for pedestrian areas shall be provided through pole mounted and bollard fixtures. Fixture Heights - Maximum fixture mounting heights shall not exceed 12 feet.

A6.04 Building Lighting - Building lighting shall be approved on an individual application basis and proposals shall be submitted as noted in Section B of these guidelines. In general, building lighting will be permitted to accent particular architectural features and entries. The following guidelines shall be addressed in the selection and placement of building light fixtures:

A Fixture Type - Fixture design shall complement the architecture of its respective building.

B Placement - Fixtures shall be located to minimize direct visibility of lamps and minimize glare; the integration of fixtures into the overall architecture is encouraged.

C Ground Mounting - Ground mounted fixtures for building lighting applications are generally discouraged for maintenance due to high maintenance and excessive glare.

A6.05 Landscape Lighting - Landscape lighting is permitted, but not required, in all development parcels. Proposed material schedule and layout shall be submitted as part of the landscape plan for each proposed development. Where Tidewater Village is intended to provide a dense architectural character landscape accents shall be a minimal component of any proposed project.

A6.06 Seasonal Lighting - Exterior seasonal lighting displays are permitted in Tidewater Village during November, December, and January. Displays are encouraged to accent buildings, mature trees, and significant site features; freestanding displays are discouraged and the use of illuminated representational decorations (snowmen, reindeer, menorahs, etc.) is not permitted in any development parcel.

Within development parcels allowing retail and food service uses, the use of seasonal light fixtures and/or components for nonpermanent exterior retail and food service spaces is permitted.

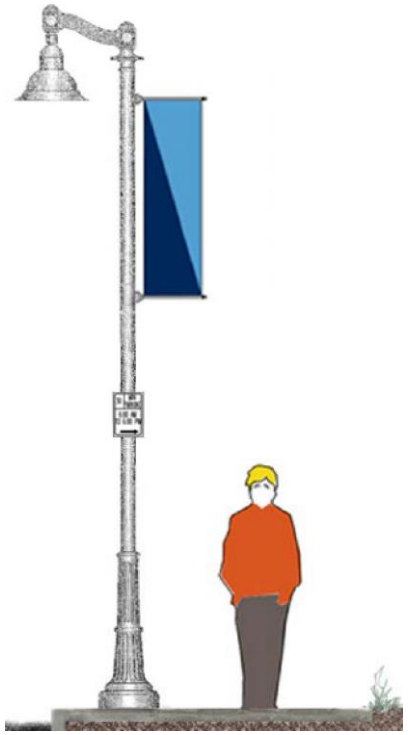


fig 12.1: Street Lights & Accessories Scaled for Pedestrians



fig 12.2: Retail Lighting Application

A7.00 Building and Site Signage

A7.01 General Design Intent - Signage guidelines are intended to develop signage that is complementary to the architecture and landscape architecture of the District. Signage should respond to the development narrative and scale of regional vernacular precedent without recreating period graphics.

Signage shall address various scales of development throughout the District:

A Project / Wayfinding Signage - The Tidewater Master Planned Development District shall be identified by major signs at the entry to the District, using a uniform graphics and materials palette that will be incorporated into smaller scale District wayfinding signage (street signs, overall tenant listings, public space navigation, etc.).

B Individual Building Signage - Building signs shall respond to the street speed limit and scale of the Village neighborhood; large scale building mounted signage is generally discouraged given view corridor distances and slow vehicle and pedestrian speeds *(figs 13.1,13.6)*.

C Building / Tenant Directory Signage - Directory signs shall use a common typeface for all building tenants. In development parcels TV1 and TV4, directory signs may be either freestanding or building mounted. In development parcels TV2 and TV3 directory signs shall be building mounted only *(figs 13.3,13.4)*.

D Individual Tenant Signage - Tenant signage may be surface or arm mounted from building facades and shall be designed and installed to complement the building architecture *(fig 13.2)*.

A7.02 Sign Materials - Acceptable primary signage materials include wood, metal, stone and solid plastic/composite. Translucent plastic is not an acceptable sign material. Three-dimensional and relief signage is encouraged *(fig 13.5)*.

A Material Finish - Gloss finishes shall not be permitted regardless of sign materials. Materials may be exposed in their natural patina or painted.

A7.03 Sign Mounting and Location - Signs may be freestanding, post mounted, surface mounted, or arm mounted. Sign mounting armatures and hardware shall complement respective building design and materials, using similar metals and colors where applicable. Signage for multiple ground floor tenants with individual exterior entries shall be surface mounted above storefront or door or arm mounted at a height ensuring clearance, visibility and fit with architectural features.

A7.04 Sign Illumination - Signs shall be externally illuminated as a component of overall exterior building lighting schemes. Internally illuminated signs shall not be permitted. Spot and/or linear light fixtures should be selected that are lamped to provide sufficient illumination without contributing glare. Fixtures shall be aimed at the ground to reduce overall light spill.



fig 13.1: Cacophony of Multiple Signs per Tenant





figs 13.3 &13.4: Simple Directory Signs for Multiple Tenants in Single Building



fig 13.2: Tenant Signage



fig 13.5: 3-D Sign



fig 13.6: Sign Scaled to Traffic

SECTION B - DEVELOPMENT PROCESS

B1.00 Tidewater Design Review

B1.01 General Conditions - All potential projects within the Tidewater Master Planned Development District will be subject to a submittal, review and approval process to ensure the overall intent of the development is maintained through the application of these guidelines. Lease and/or purchase and sale agreements will be conditional pending the receipt of approval through this process.

B1.02 Review Process - The submittal and review process shall be independent of, and shall occur prior to, submission of a Site Plan Review Application to the Town of Falmouth.

A Tidewater Village Association will engage the services of third-party design professionals to review all applications. The review will be conducted by design professionals holding State of Maine Architect and/or Landscape Architect licenses. The applicant shall follow the standards set forth in these guidelines as well as standards and design criteria required for site plan review by the Town of Falmouth.

B Following receipt of a complete submission package, five (5) business days shall be allowed for the review process which may include comments for providing modification to application, grant approval, grant approval with conditions, or deny approval with written explanation.

C The definitions, descriptions and intent conveyed in these Guidelines shall be the primary review criteria.

D Any proposed modifications to previously approved improvements shall be submitted for review under the approval process outlined herein.

E The Review Board retains the right to approve or reject submitted improvements, in part or in full.

B1.03 Submittal Requirements - For all project, up to five (5) sets of the following items shall be submitted for review, with one set being returned to the applicant:

A Application - The review application outlines primary project parameters.

B Fee Schedule - The applicant shall be responsible for payment of all professional review fees, outlined as follows. Fees and schedules subject to change over time.

Review fees:

1	Any (exterior) modification to previously approved or existing building or landscaping:	$1,000
2	Building architecture design review:	$2,000
3	Site design review:	$1,500
4	Landscape and lighting design review:	$1,500
5	Closeout review, issuance of occupancy permit (to be scheduled with Owner):	$750

C Project Description - A written narrative describing the general scope, design intent, and parameters of the proposed project. Anticipated utility requirements, and a written maintenance program proposal shall also be submitted.

D Site Plan - A site plan of the entire project area showing existing adjacent streets, open spaces and buildings. The site plan shall indicate layout, materials and colors of all site improvements, including, but not limited to, proposed parking, crosswalks, sidewalks, screen enclosures, utility meters/connection locations, signage types locations, and site lighting locations. Use of construction details to portray intent is recommended.

E Grading & Drainage Plan - All existing contours, wetland delineations, and proposed grading, drainage, and stormwater improvements shall be indicated. Indicated finish floor elevations at building egresses. If the entry level is not directly at grade, the site and grading and drainage plans shall show all stairs and ramps required to meet accessibility requirements.

F Landscape Plan - A drawing indicating plant material placement, species and installed sizes. Also include:

1 Site lighting, including parking area lights, sidewalk lighting, bollards, sign lighting, and landscape lighting, if proposed. In addition to required post-mounted site lighting, if bollard and/or landscape lighting is proposed, outline intent and materials proposed for use. Baffling measures shall be taken if necessary to reduce glare and light trespass onto abutting residential property.

2 Indicate ground coverings: type of mulch, grass, wildflowers, wetland plantings, rock, leaf litter, etc. Provide outline of grassing method, species mix, application rate if seed.

3 If automatic irrigation is proposed, outline water source and supply flow data (gpm/psi), backflow prevention method and location, controller type and location, general design layout, zoning, material, provisions for emergency shut off and overwintering.

Water efficient nozzles on pop-up sprays and gear-driven rotary heads shall be utilized; use of riser pipes shall be kept to a minimum. A rain sensor shall be installed for each automatic controller installed. Sprays shall be zoned separately from rotary heads; zoning design should take into account variable light conditions, soil conditions, and plant material/ grass use.

G Building / Site Section - A primary building section shall be submitted indicating overall volume, roof heights, profiles and slopes, and all floor level elevations. Projects proposed for certain development parcels and sites will be required to include site section information with the building section submittal.

H Building Elevations - All elevations must be shown clearly describing overall massing, roof configurations, entry sequences, fenestration, lighting, signage, roof accessories, utility connections and venting parameters. Materials and/ or colors may be indicated on the elevations or through a separate material narrative.

I Material Narrative - A written and graphic proposal outlining potential material and color selections for the project, defining major building facades, trim and accents, and roof materials.

J Signage - All proposed signage shall be submitted with the review package. Submittals shall identify sizes, materials, typefaces, finishes, mounting systems and lighting strategies.

K Lighting Narrative - In addition to lighting required with the Site and Landscape Plans, submissions shall include proposed all building and sign illumination. Retail and/or storefront lighting systems shall be submitted for all retail development.

SECTION C - DEVELOPMENT PARCELS

C1.00 TV1 Development Parcel
General Conditions and Intent

The TV1 Development Parcel is located at the southern terminus of the Clearwater Drive visual axis and is intended to support a single stand-alone building. The parcel area of approximately .55 acres is physically isolated from other sections of Tidewater Village *(fig 17.1)*, however the overall design of building and site components shall be consistent with the remainder of the development to ensure visual continuity.

C1.01 Permitted Uses – Permitted use is limited to Commercial Office use only.

C1.02 Maximum Building Size – The maximum building gross floor area is 6,000 square feet.

A. The maximum building height is three stories.

C1.03 Lot Coverage – The amount of green space cannot be reduced by more than 5% from the area illustrated on the Development District master plan. Refer to the District Zoning Ordinance for setback parameters.

C1.04 Visual Orientation – The primary building entry shall face Clearwater Drive or the Clearwater Drive traffic circle, dictating a north-facing entrance condition. The use of covered entries and/or entry porches is encouraged to mitigate weather exposure and provide visual scale to the building.

C1.05 Open Space – This parcel includes significant open space that shall be developed to meet screening and landscaping requirements of these guidelines. Additional development must address existing topography and adjacent building conditions.

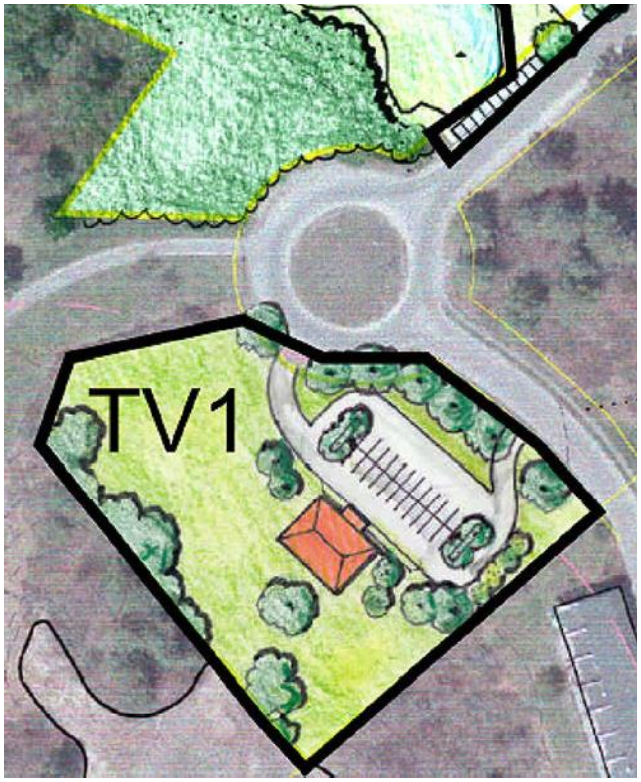


fig 17.1: TV1 Development Parcel



fig 17-2: Stand-alone Building Development

C2.00 TV2 Development Parcel
General Conditions and Intent

The TV2 envelope area is a multi-building parcel located along Clearwater Drive and adjacent to the primary entry to the Tidewater Farms neighborhood. The parcel area ofapproximately 3.42 acres is adjacent to the center of Tidewater Village *(fig 18-1)*.

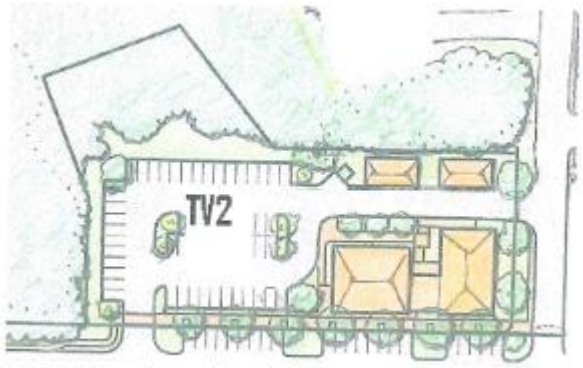


fig 18-1: TV2 Development Parcel

C2.01 Permitted Uses – Permitted structures and uses as defined by the Tidewater Master Planned Development District Zoning Ordinance are as follows:

(Enumeration corresponds to list of permitted uses in Zoning Ordinance.)

1 Accessory buildings and structures
4 Multi-family dwellings
5 Apartments on the upper floors of a mixed-use building
6 Business and professional offices
7 Research facilities
9 Outdoor facilities for recreation, entertainment and culture
10 Retail and service establishments and commercial schools
11 Restaurants
12 Outdoor eating areas
14 Municipal buildings and uses
15 Day care centers
16 Churches
17 Health institutions
18 Libraries
19 Museums
20 Private clubs
26 Grocery Retail
28 Affordable Housing Developments

C2.02 Conditional Uses

1 Public utilities
2 Light manufacturing operations with no exterior storage of material, equipment or products
3 Home occupations

C2.03 Maximum Building Size – The maximum combined building footprint gross floor area is 9,700 square feet.

A. The maximum building height is three stories.

B. No more than 3 buildings are permitted – buildings may be linked to create a larger contiguous floor area provided the maximum footprint is as noted above *(fig 19-2).*

C2.04 Lot Coverage – The amount of green space cannot be reduced by more than 5% from the area illustrated on the Development District master plan (fig 18-1). Refer to the District Zoning Ordinance for setback parameters.

C2.05 Visual Orientation – The primary building entry shall face Clearwater Drive and adjacent street edges. Corner buildings shall address all street edges and shall have more than one direct entry.

C2.06 Open Space – Open space development is focused around building perimeters and interstital spaces, with connecting walkway opportunities into the Tidewater Farm neighborhood.



fig 19-1: Storefront Scale at Sidewalk



fig 19-2: Linked Buildings

C3.00 TV3 Development Parcel
General Conditions and Intent

The TV3 envelope area is a multi-building parcel located along Clearwater Drive and adjacent to the primary entry to the Tidewater Farms neighborhood. The parcel area of approximately 1.34 acres is adjacent to the center of Tidewater Village *(fig 20.1)*

C3.01 Permitted Uses – Permitted structures and uses as defined by the Tidewater Master Planned Development District Zoning Ordinance are as follows:

(Enumeration corresponds to list of permitted uses in Zoning Ordinance.)

1 Accessory buildings and structures
4 Multi-family dwellings
5 Apartments on the upper floors of a mixed-use building
6 Business and professional offices
7 Research facilities
9 Outdoor facilities for recreation, entertainment and culture
10 Retail and service establishments and commercial schools
11 Restaurants
12 Outdoor eating areas
14 Municipal buildings and uses
15 Day care centers
16 Churches
17 Health institutions
18 Libraries
19 Museums
20 Private clubs
26 Grocery Retail
28 Affordable Housing Developments

C3.02 Conditional Uses

1 Public utilities
2 Light manufacturing operations with no exterior storage of material, equipment or products
3 Home occupations

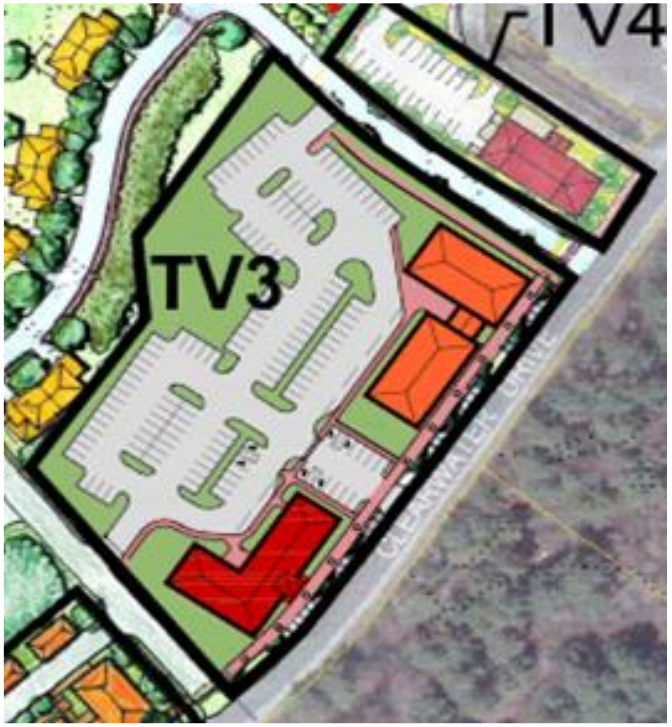


Fig 20.1: TV3 Development Parcel

C3.03 Maximum Building Size – The maximum combined building gross floor area is 74,000 square feet.

A. No individual building can have a footprint larger than a gross floor area of 11,000 square feet.

B. The total footprint of all buildings shall not exceed 23,500 gross square feet.

C. The maximum building height is three stories.

D. No more than 3 buildings are permitted – buildings may be linked to create a larger contiguous floor area provided the maximum footprint is as noted above.

C3.04 Lot Coverage – The amount of green space cannot be reduced by more than 5% from the area illustrated on the Development District master plan *(fig.20-1)*. Refer to the District Zoning Ordinance for setback parameters.

C3.05 Visual Orientation – The primary building entry shall face Clearwater Drive and adjacent street edges. Corner buildings shall address all street edges and shall have more than one direct entry. .
(figs 20-1,)

C3.06 Open Space – Open space development is focused around building perimeters and interstital spaces, with connecting walkway opportunities into the Tidewater Farm neighborhood.

A. Significant wooded buffers shall be maintained and/or developed to provide separation of building and parking areas as indicated on the master plan *(fig 20-1)*.



fig 21-2: Space for Unprogrammed Events



fig 21-3: Signature Corner Building

C4.00 TV4 Development Parcel General Conditions and Intent

The TV4 Development Parcel is located at the northern end of Tidewater Village on Clearwater Drive and is the first parcel to be approached from Route 1. It is also immediately adjacent to a primary entrance to Tidewater Farm. It is intended to support a single stand-alone building with a parcel area of approximately 1.96 acres *(fig 22-1)*. Development of TV4 is tasked with providing at least two "gateways" to neighboring residential and commercial developments.

C4.01 Permitted Uses – Permitted uses are limited to Commercial Office, Restaurants and Outdoor Dining Areas use only. Public access is prohibited in basement areas.

C4.02 Maximum Building Size – The maximum building gross floor area is 8,000 square feet, exclusive of basements.

A. The maximum building height is three stories.

C4.03 Lot Coverage – The amount of green space cannot be reduced by more than 5% from the area illustrated on the Development District master plan *(fig 22-1)*. Refer to the District Zoning Ordinance for setback parameters.

C4.04 Visual Orientation – The primary building entry shall address Farm Gate Road, Clearwater Drive or Hat Trick Drive.

C4.05 Open Space – Open space on this parcel is limited and shall include visual and/or landscape buffers from adjacent streets and other properties.



fig 22-1: TV4 Development Parcel



fig 22-2: Freestanding Building

Attachment H

Tidewater Village Design Guideline Review Response (Civil)

Tidewater Village Design Guideline Review Response (Civil Engineering)

The below sections reference the Tidewater Village Design Guidelines as they relate to the site plan aspects of the project, specifically Section C 3.00 for the TV3 parcel. These criteria and details of implementation are also provided on the site plan, Sheet 1 of the plan set. Each section of the code applicable to the project has been listed with a narrative of how this section is met, how it is applicable, or actions proposed to be taken.

Section C3.01: The project currently proposes multi unit mixed residential and commercial development for buildings A and B. The final uses for the commercial spaces will be based on tenant requirements, and will be compliant with the uses shown in this section.

Section C3.02: No conditional uses are proposed at this time.

Section C3.03: Per the details provided on Sheet 1 of the plan set, the total combined gross floor area is proposed as 45,585 s.f., less than the 74,000 s.f. maximum.

Section C3.03-A: Per the details provided on Sheet 1 of the plan set, the largest individual building footprint is 9,695 s.f., less than the 11,000 s.f. maximum.

Section C3.03-B: Per the details provided on Sheet 1 of the plan set, the total footprint of all proposed buildings on site is 18,596 s.f., less than the 23,500 s.f. maximum.

Section C3.03-C: Per the details provided on Sheet 1 of the plan set, the tallest building on site will be 3 stories, in compliance with the requirements of the design guide.

Section C3.03-D: Per the details provided on Sheet 1 of the plan set, 2 buildings are proposed. Buildings A and B are proposed to be linked with a foyer, and per the response to section C3.03-B above, the project is in compliance with the maximum total building footprint.

Section C3.04: Based on figure 20.1 of the design guide, the project would appear to maintain the green space required. The design guide did not contemplate the presents of wetlands on the parcel, and given Maine DEP criteria on wetland impacts, a wetland central to the project will be maintained in order to meet DEP impact requirements. Where figure 20.1 effectively proposed fully developing the parcel, the proposed project will not impact the areas of the wetlands to be preserved. This plan should demonstrate that the project may actually provide more green space than figure 20.1 suggests. Per the contract zoning for this project, Falmouth Town Code section 19-23.2-C, there are no property setback requirements for mixed use development.

Section C3.05: The proposed buildings are located with entrances along Clearwater Drive and Farm Gate Road, where there will be multiple points of access. The project also proposes that the mixed use residential / commercial buildings will have additional access in a courtyard style entrance internal to the parcel.

Section C3.06-A: The wooded buffer along the north of the parcel will remain, and is in control of and maintained by the Tidewater Farm neighborhood and will serve as an effective visual buffer. Existing walkways along the bounding streets will continue to serve as connections between Tidewater Farm and Tidewater Village, and are not proposed to be removed or reduced.

Attachment I

Tidewater Village Design Guideline Review Response (Building Architect)

MICHAEL E COUTURE, ARCHITECT
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603.387-5817 michael.e.couture@gmail.com

TIDEWATER 3
ARCHITECTURAL NARRATIVE
10.17.25

A1.00 DEVELOPMENT OVERVIEW

A1.01 APPLICABLE ORDINANCES AND CODES

THE PROJECT IS BEING DESIGNED WITHIN THE PARAMETERS OF THE ZONING AND SITE PLAN REVIEW ORDINANCES AND PER:

MAINE UNIFORM BUILDING AND ENERGY CODE (MUBEC)
2015 INTERNATIONAL RESIDENTIAL CODE (IRC)
2015 INTERNATIONAL BUILDING CODE (IBC)
2015 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
NFPA 101 – LIFE SAFETY CODE

A1.02 AMERICAN WITH DISABILITIES (ADA)

THE PROJECT IS BEING DESIGNED TO THE NEWEST EDITION OF THE AMERICANS WITH DISABILITES (ADA)

A5.00 ARCHITECTURE

A5.01 GENERAL DESIGN INTENT

THE PROPOSED STRUCTURES ARE DESIGNED BASED ON LOCAL AND REGIONAL VERNACULAR DESIGN IN KEEPING WITH THE FALMOUTH COMMUNITY SCALE AND AESTHETIC.

A5.02 MASSING

THE PROPOSED BUILDINGS CONSIST OF TWO SIMPLE RECTANGULAR FORMS WITH TRADITIONAL GABLE ROOFS, CONNECTED WITH A COMMON LOBBY WITH VERTICAL ACCESS TO THE UPPER LEVELS.

SECONDARY MASSING CONSISTS OF RESIDENTIAL UNIT COVERED DECKS EXTENDING BEYOND THE PRIMARY RECTANGULAR BUILDING MASS.

A5.03 FAÇADE / FENESTRATION

THE BUILDING FACADES ADDRESS BOTH THE PUBLIC STREETS AND THE INTERNAL CIRCULATION. AS THE TWO STRUCTURES ARE LOCATED AT THE INTERSECTION OF CLEARWATER DRIVE AND WILLOW LANE THE SKEWED ANGLE WHERE THE TWO STRUCTURES MEET REFLECTS THE ANGLE OF THE INTERSECTION.

FENESTRATION, WHILE PRIMARILY A RESULT OF THE BUILDING'S INTERIOR LAYOUT ARE IN KEEPING WITH THE COLOR, SCALE AND PROPORTION OF THE EXTERIOR FACADES.

THERE ARE NO SKYLIGHTS OR SKYLIGHT STRUCTURES IN BUILDINGS.

A5.04 EXTERIOR MATERIALS AND COLORS

THE PROPOSED DESIGN INCORPORATES VARIOUS BUILDING MATERIALS INCLUDING NATIVE NEW ENGLAND STONE VENEER, VERTICAL BOARD AND

BATTEN AND CLAPBOARD AND SHAKES. COLOR PALETTE TO BE NATURAL TONES AND WHITE.

VERTICAL BOARD AND BATTEN, CLAPBOARD AND SHAKES ARE ANTICIPATED TO BE MADE FROM ENGINEERED WOOD, SUCH AS 'LP BUILDING SOLUTIONS' PRODUCTS.

WINDOW TRIM, CORNER BOARDS, POSTS AND EXPOSED STRUCTURAL ROOF TRUSSES (AT COVERED DECKS) WILL BE WRAPPED WITH PVC TRIM SUCH AS 'VERSATEX'.

A5.05 ROOFS AND DORMERS

A. ROOF PROFILE AND SLOPE – THE PROPOSED BUILDINGS ARE DESIGNED WITH SIMPLE GABLE ROOF PROFILES WITH GABLE 'DORMERS' AT ENTRIES AND COVERED DECKS. ROOF PITCHES ARE 6:12.

B. ROOF MATERIALS – ALL ROOFS TO BE COMMERCIAL GRADE ARCHITECTURAL ASPHALT SHINGLES.

C. ROOF ACCESSORIES, VENT SYSTEMS, GUTTERS AND DOWNSPOUTS (WHERE REQUIRED) TO BE OF COMPLIMENTARY MATERIALS AND UNOBSTRUSIVE.

D. DORMER ROOFS ARE PROVIDED OVER THE COVERED DECKS.

E. MAXIMUM BUILDING HEIGHT – THE PROPOSED BUILDINGS ARE TWO AND THREE STORIES WITH A 42' MAXIMUM HEIGHT FROM GRADE TO PEAK.

Attachment J

Tidewater Village Design Guideline Review Response (Landscape Architect)

Tidewater Village Design Guidelines

A3.00 Sidewalks / Street Furnishings

A3.01 Outdoor Public Spaces - The District master plan illustrates a number of outdoor spaces for programmed and unprogrammed activity. These include interstitial spaces between building areas (figs 6-1, 6-2), courtyards, and a prominent center green (see C3.00) as a focal point for the District. Outdoor spaces should be linked to longer pedestrian pathway systems, forming start and stop destinations to encourage pathway use (figs 6-1 thru 6-5).

A. The design vocabulary and material palette for outdoor public spaces shall be consistent throughout the District and should complement adjacent architecture and landscape architecture design.

- **Materials include concrete sidewalk leading from Clearwater Drive adjacent to the proposed building leading to the internal pedestrian circulation serving access to the apartment units and extending along the frontage of the commercial units. The concrete will have detailed tool edging and broom finish. The sidewalk along the northerly side will be bituminous and will extend to the existing and expanded parking area and to Farm Gate Road. This sidewalk will provide pedestrian access from the expanded parking lot to the proposed apartment and commercial building. There will be a patio area consisting of precast concrete pavers, located on the southerly side of the main entry facing Waterview Way that will provide seating and gathering for tenants as well as employees of the commercial uses.**

B. With creative and coordinated use of paving materials, public gathering areas, sidewalks, and waiting areas can be designed to have a unique style that could and should be replicated throughout the Village.

- **The main entry plaza provides a welcoming entry as well as an opportunity for seating. There are proposed benches located along the edge of planting areas. There will be small pockets of seating along the front of the commercial space as well, where the sidewalk is wider extending to the face of building. Pedestrian scale lighting and corresponding building mounted lighting will provide for safe access during nighttime conditions.**

A3.02 Outdoor Retail Activity - Exterior space adjacent to retail and food service occupancies should be designed to accommodate the extension of these businesses in fair weather. Ideally these areas shall be visible from primary outdoor public spaces (fig 6--2).

A. Changes in sidewalk material can delineate exterior seating areas in front of food service establishments. Additional walkway width should be provided to ensure that tables and chairs do not restrict regular pedestrian traffic.

- **The sidewalk area in front of the commercial space is wider and offers opportunities for seating as well as potential extension of commercial activities during fair weather. Seating and other furniture will not be allowed to encroach into the pedestrian area. The scoring detail for the concrete sidewalk will provide for a visual break.**

B. Building canopies provide cover and definition for sidewalk sales activity.

- **There are decks for the apartments above that extend over the commercial uses and will provide for some cover over entry and seating areas.**

A3.03 Street Furnishings - A comprehensive system of street furnishings shall be incorporated into all development parcels. Street furnishings include railings, bicycle racks, bollards, trash receptacles, benches, planters, etc.

A. The design vocabulary and material palette for street furnishings shall be consistent throughout the District and should complement adjacent architecture and landscape architecture design (figs 7-1, 7-2).

- **The selected street furnishings are compatible with the Tidewater area. A family of seating, trash receptacles and bike rack has been chosen. The general area of Clearwater Drive has a limited selection of street furniture to establish a palate, so the selection of furnishings is compatible with the associated uses.**

B. Materials must be durable and be able to withstand the rigors of heavy public use and Maine climatic conditions. Acceptable materials include heavy-gauge aluminum, galvanized steel, cast or wrought iron, granite and stone. Bench slats and decking may be recycled plastic/synthetic wood fiber (fig 7-4). Extensive use of wood is discouraged, as well as use of "old style" park benches with wood slats and formed concrete supports.

- **The selected furnishings will be powder coated steel selected from the same family of furnishings.**

C. All street furnishings shall be secured to imbedded footings, not surface mounted or freestanding.

- **Seating, and bicycle racks will be ground mounted and trash containers that do not have ground mount capability will be anchored to the concrete pavement or concrete pads.**

D. Where possible, building and site designs are encouraged to directly incorporate street furnishing needs to provide a visually integrated streetscape. Canopies for public telephones and transportation areas can readily be designed as exterior building components.

- **Not Applicable**

A3.04 Paving and Curbing - Sidewalk paving and curbing materials shall be consistent throughout the Village, shall complement adjacent architecture, and in all cases shall be distinct from roadway and parking lot paving materials (figs 4-2,4-4,5-3).

A. Sidewalks and ramps in all areas shall meet the current standards of ADA accessibility.

- **Sidewalks and ramps have been designed in compliance with ADA standards.**

B. Sidewalk materials shall vary to provide visual and tactile awareness of transition between areas of significant use and scale change.

- **The proposed primary sidewalks internal to the site with access to the residential and commercial uses will be concrete. The transition from the brick sidewalk along Clearwater Drive is very distinctive and the pattern of score joints, tooling and textured surface provides visual variety.**

- **The sidewalk on the northerly side will be bituminous, this is a secondary sidewalk that provides a connection to Farm Gate Road and provides pedestrian connectivity from the expanded parking area in the northwest corner to the apartments and commercial uses.**

- **Sidewalk connections from the existing parking have been provided.**

C. Curbing materials shall be granite or precast concrete set vertically or sloped to best suit the specific site condition. Curb sections shall be set flush to street pavement surface at ramp transitions.

- **Curbing will be slipform concrete and monolithic concrete curb and sidewalk as shown on the plan. Curbing around parking islands and vegetated edges of parking area will be sloped slipform concrete.**

A3.05 Street & Parking Crossings - Street crossing materials shall be visually and texturally distinct from roadway and parking lot paving materials to clearly delineate crossing areas in all seasons.

A. The use of bollards and exaggerated curbing can denote crossing areas without additional signage (fig 7-5).

- **Not Applicable**

B. Unit pavers edged with granite bands may be used to delineate crosswalks in lower traffic areas (parking lots), but may not be used in street rights-of-way; in those instances, paver crossings may be mimicked with white-painted borders and solid-painted infill (fig 4-2). Pavement stamping or imprinting is not a durable treatment and is therefore not recommended for use.

- **Crosswalk will be painted with a wide band graphic to call out the crossing.**

A4.00 Landscape Architecture

A4.01 Master Landscape Plan - An overall master landscape plan will be developed for the District by the project Landscape Architect identifying plant palettes, site amenities, furnishings, site lighting, and irrigation systems for common areas. Complementing the overall architectural design intent developed from regional vernacular context, the proposed landscaping will consist primarily of native plant material.
The master plan shall correspond to the overall Tidewater Master Planned Development District to ensure coordination of development buffers, sight lines, and utility systems. The master plan will include specific landscape requirements for each development parcel. Public open spaces will be defined on the plan, particularly public spaces in TV2 and TV3.

- **Proposed plantings follow the intent of the District Landscape Plan**

A4.02 Parcel Landscape Plan - Development proposals within each parcel shall include parcel landscape plans as described in Section B of these guidelines. Refer to Sec. 9.28 of Falmouth Zoning Ordinance for Landscaping Standards.

A. Detailed landscaping of parking areas and building parcels should respond to and be consistent with the Master Landscape Plan developed for the common areas and buffers.

- **The proposed planting plan has been designed to meet the intent of the Master Landscape Plan. The use of native plantings has been incorporated to the greatest extent possible and provide seasonal variation and contrast.**

B. Plant material selection should strive to include plants with year-round interest combined with plants with seasonal change. Written schedule and species selection for annual flower bed planting should be included in the submission.

- **Annual Plantings are not proposed.**

C. Placement of Tree Material - Various species shall be recommended for specific applications: salt-tolerant species within parking areas, minimum six (6) feet of clear trunk on trees with pedestrian or vehicular passage beneath, broad canopy trees at major public open spaces, and dense and/or non-deciduous species for screening and buffering use. Trees adjacent to buildings shall be coordinated with building design, incorporated into storefront canopy/ awning, signage, and lighting systems (fig 8-1).

- **Tree species have been selected appropriately for identified locations, canopy trees for parking area and perimeter of parking and along perimeter of the parcel. Understory flowering trees have been selected to reinforce access, provide seasonal variation and character.**

D. Existing Trees - Every proposed site plan shall identify existing mature trees within the impacted development area. Provide a written management plan outlining trees proposed for removal and protection measures to safeguard remaining trees during construction.

- **The majority of the site will be developed except for the area located in the northeasterly corner of the site that is predominantly wetland and will be left undisturbed.**

A4.03 Maintenance and Replanting - Refer to Sec. 5.37 of Falmouth Zoning Ordinance for ongoing maintenance and replacement requirements. A monthly fee will be assessed to each parcel owner for landscape maintenance, snow removal, etc.

A4.04 Site Walls / Fencing - Site walls and fencing may be used to delineate exterior spaces, to provide planting and screening opportunities, and enhance building and parking area entries and separation. In all cases wall and/or fence material shall be complementary with adjacent buildings (figs 8-2,8-3).

Proposed walls and fencing shall be identified on the landscape plan submitted with all development proposals as noted in Section B of these guidelines.

- **There are no site walls or fencing proposed.**

A6.03 Sidewalks / Walkways - Lighting for pedestrian areas shall be provided through pole mounted and bollard fixtures. Fixture Heights - Maximum fixture mounting heights shall not exceed 12 feet.

- **The parking lot fixtures are mounted at 16 FT, the additional height reduces the number of fixtures required to achieve a well distributed lighting level. We should point out that the fixtures along Clearwater Drive exceed the 12 FT maximum height. The proposed fixtures will have dimmers to reduce the lighting level after business hours for commercial uses and reduce impacts upon residential units. Refer to photometric plan and fixture catalog sheets.**

A6.04 Building Lighting - Building lighting shall be approved on an individual application basis and proposals shall be submitted as noted in Section B of these guidelines. In general, building lighting will be permitted to accent particular architectural features and entries. The following guidelines shall be addressed in the selection and placement of building light fixtures:

A. Fixture Type - Fixture design shall complement the architecture of its respective building.

B. Placement - Fixtures shall be located to minimize direct visibility of lamps and minimize glare; the integration of fixtures into the overall architecture is encouraged.

- **Building Emergency Egress doors will be provided with full cutoff LED wall-pac fixtures. Refer to lighting documentation attached.**

- **Residential deck lighting will be provided either surface mounted or recessed LED fixtures independently controlled by individual units.**

- **Building mounted fixtures will be located at the main entrance to the building and along the commercial establishments. Fixtures are compatible with the pole mounted light fixtures.**

C. Ground Mounting - Ground mounted fixtures for building lighting applications are generally discouraged for maintenance due to high maintenance and excessive glare.

- **No ground mounted lighting is proposed**

A6.05 Landscape Lighting - Landscape lighting is permitted, but not required, in all development parcels. Proposed material schedule and layout shall be submitted as part of the landscape plan for each proposed development. Where Tidewater Village is intended to provide a dense architectural character landscape accents shall be a minimal component of any proposed project.

- **Landscape lighting is not proposed**

A6.06 Seasonal Lighting - Exterior seasonal lighting displays are permitted in Tidewater Village during November, December, and January. Displays are encouraged to accent buildings, mature trees, and significant site features; freestanding displays are discouraged and the use of illuminated representational decorations (snowmen, reindeer, menorahs, etc.) is not permitted in any development parcel.
Within development parcels allowing retail and food service uses, the use of seasonal light fixtures and/or components for nonpermanent exterior retail and food service spaces is permitted.

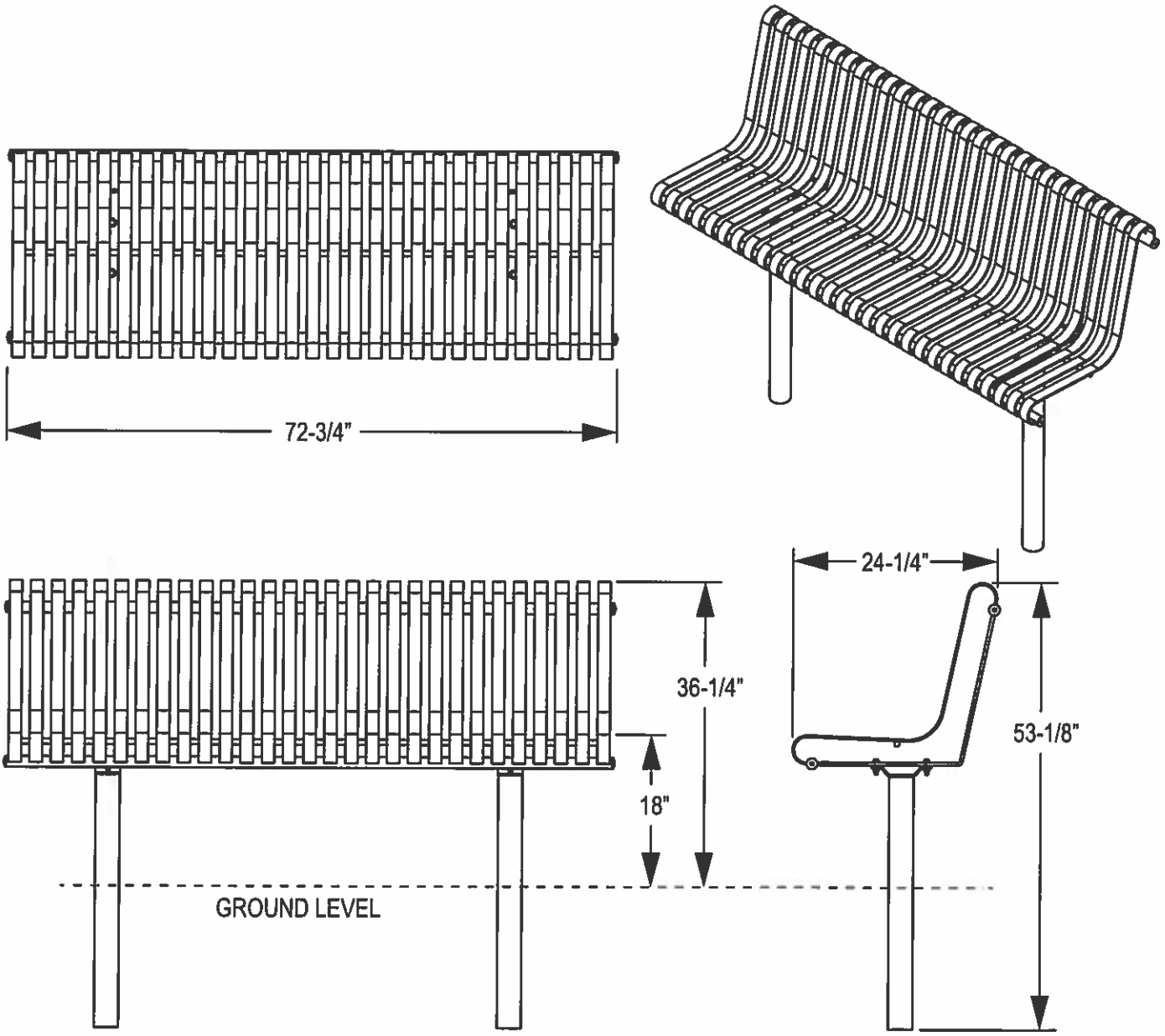
- **No seasonal lighting is proposed.**

Attachment K
Site Furniture Details

627 Amersale Drive
Naperville, IL 60563
Phone: (800) 323-5664
Fax: (630) 897-0573
sales@belson.com

Model # 43S-S6 **Dimension Sheet**

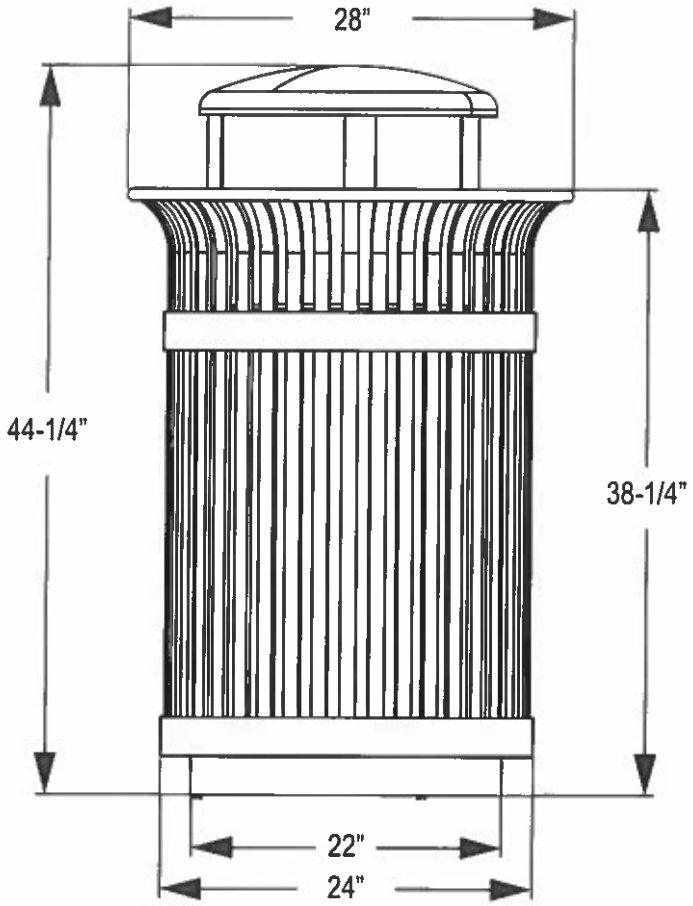
6' KENSINGTON BENCH
IN-GROUND MOUNT

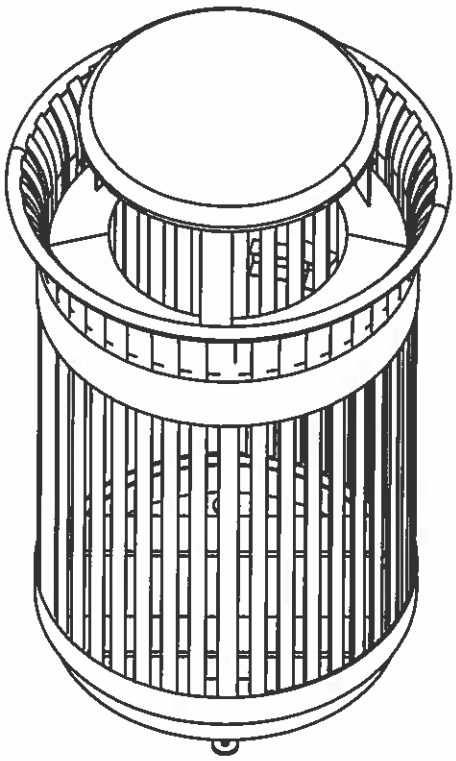


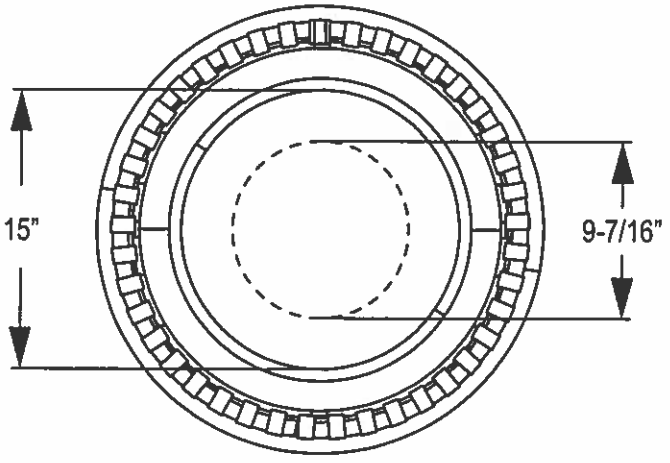
627 Amersale Drive
Naperville, IL 60563
Phone: (800) 323-5664
sales@belson.com

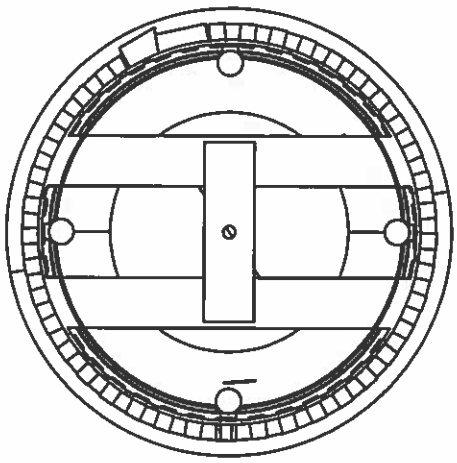
Model # CBTR-FTRB-BK **Dimension Sheet**

FLARE TOP TRASH RECEPTACLE | RAIN BONNET LID





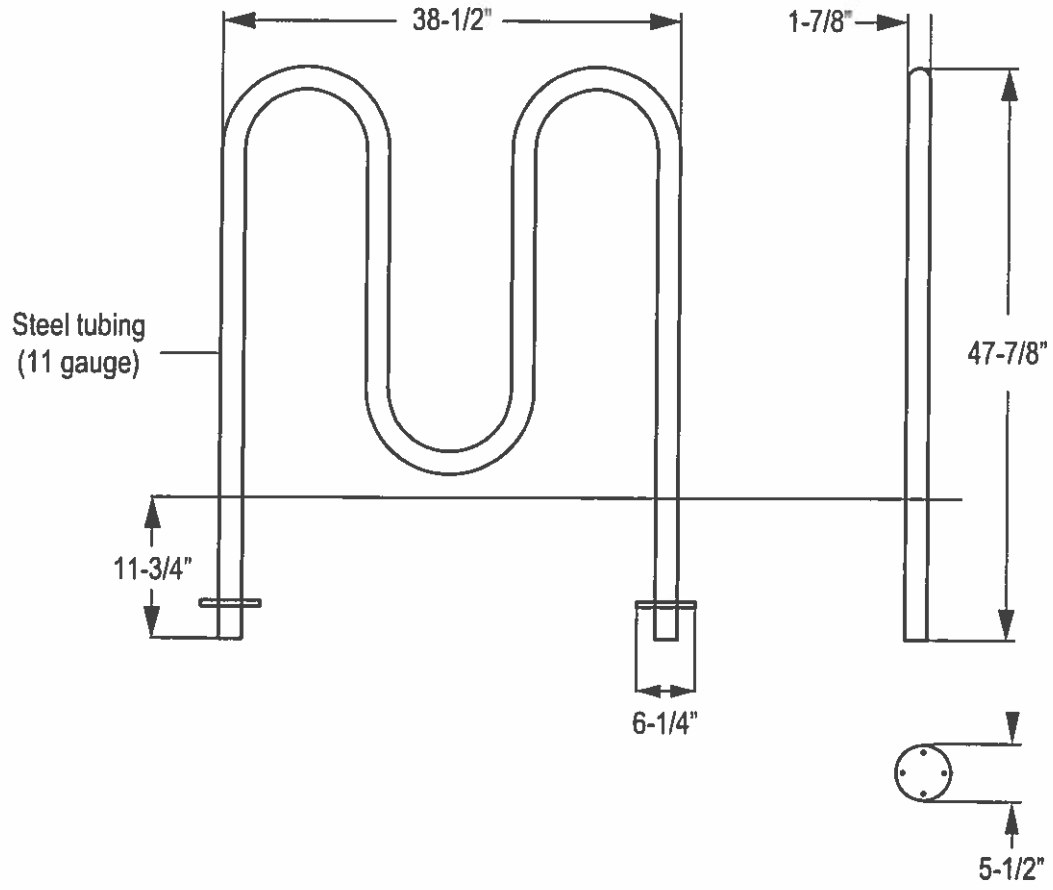




627 Amersale Drive
Naperville, IL 60563
Phone: (800) 323-5664
Fax: (630) 897-0573
sales@belson.com

Model # CBBR-5URI-BK **Dimension Sheet**

5 BIKE 'U' BIKE RACK, POWDER-COATED BLACK, IN-GROUND MOUNT



Attachment L
Light Fixture Cut Sheets

BEACON
design . performance . technology

URBAN SERIES

URBAN MICRO STIRKE

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

MICRO STRIKE

FEATURES

- Decorative transitional style lighting fixture series is suitable for walkway lighting and wall mounting
- Two unique shade and style options



C US

*3000K and warmer CCTs only

CONTROL TECHNOLOGY

energeni

SPECIFICATIONS

CONSTRUCTION

- The drivers shall be located in the top cast housing and shall be accessible without tools by hinging the lower shade assembly. The driver and all electrical components shall be on a tray
- The lower shade shall be made from a one-piece aluminum spinning
- The housing is designed for LED thermal management without the use of metallic screens, cages, or fans. The top casting shall be able to be pendent mounted in place with a stainless steel safety pin and then permanently held in place with four stainless steel bolts

ELECTRICAL

- Universal 120-277 VAC or 347-480 VAC input voltage, 50/60 Hz
- Ambient operating temperature -40°C to 40°C
- Drivers have greater than 90% power factor and less than 20% THD
- LED Drivers have output power over-voltage, over-current protection and short circuit protection with auto recovery

ELECTRICAL (CONTINUED)

- Field replaceable surge protection device provides 20kA protection meeting ANSI/ IEEE C62.41.2 Category C High and Surge Location Category C3; Automatically takes fixture off-line for protection when device is compromised
- Button photocell available
- Ambient operating temperature -40°C to 40°C

CONTROLS

- Available with Energeni for optional set dimming, timed dimming with simple delay, or timed dimming based on time of night visit

FINISH

- IFS polyester powder-coat electrostatically applied and thermocured
- IFS finish consists of a five stage pretreatment regimen with a polymer primer sealer and top coated with a thermoset super TGIC polyester powder coat finish
- The finish meets the AAMA 605.2 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance and resists cracking or loss of adhesion per ASTM D522 and resists surface impacts of up to 160 inch-pounds

CERTIFICATIONS

- NRTL Certified, UL8750, UL 1598 and CSA22.2#250. 13-14 for wet locations
- Meets IDA recommendations using 3K CCT configuration at 0 degrees of tilt

WARRANTY

- 5 year warranty

KEY DATA	
Lumen Range	3,000–22,000
Wattage Range	25–175
Efficacy Range (LPW)	109–137

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BEACON
design . performance . technology

URBAN SERIES

URBAN MICRO STRIKE

DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

ORDERING GUIDE

Example: URB–CAP-21–80L-25–5K7–UNV–4W–NRNW–BLT

CATALOG #

Model	
URB	Urban

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

Engine–Watts	
80L-25	25W, LED array
80L-39	39W, LED array
80L-50	50W, LED array
80L-70	70W, LED array
80L-90	90W, LED array
80L-110	110W, LED array
160L-115	115W, LED array
160L-135	135W, LED array
160L-155	155W, LED array
160L-175	175W, LED array

CCT/CRI [3]	
3K7	3000K, 70 CRI
4K7	4000K, 70 CRI
5K7	5000K, 70 CRI
27K8	2700K, 80 CRI
3K8	3000K, 80 CRI
4K8	4000K, 80 CRI
5K8	5000K, 80 CRI

Voltage	
UNV	120-277V
347	347V
480	480V

Optics	
2	Type II
3	Type III
4F	Type IV forward
4W	Type IV wide
5QW	Type V sq wide

Options	
PCU	Button Photocell, Universal (120v-277V)
BC	Backlight Control

Control Options	
GENI-XX	Energeni [2,5]

Mounting Style	
PM	Pendant mount
SM	Side mount [1]
YM	Yoke mount [4]

Mounting Size	
3	3" OD Pole [4]
4	4" OD Pole [4]
5	5" OD Pole [4]

Style	
NRNW	No rings
3RNW	Three rings

Finish	
BLT	Black Matte Textured
BLS	Black Gloss Smooth
DBT	Dark Bronze Matte Textured
DBS	Dark Bronze Gloss Smooth
GTT	Graphite Matte Textured
LGS	Light Grey Gloss Smooth
PSS	Platinum Silver Smooth
WHT	White Matte Textured
WHS	White Gloss Smooth
VGT	Verde Green Textured

Color Option	
CC	Custom Color

Notes:

1 Side mount is designed to mount over 2" Schedule 40, (2.38 arm)

2 When ordering Energeni, specify the routine setting code (Example GENI-04). See Energeni brochure and Energeni instructions for setting table and options. Not available with sensor options https://www.currentlighting.com/outdoor-lighting/energeni/249071

3 This product is approved by the Florida Fish and Wildlife Conservation Commission. Separate spec available on our website. Turtle Friendly: https://cdn.currentlighting.com/site/specsheet/Urban_LED_spec_sheet_turtle-friendly.pdf

4 Yoke mount mounting Style only

5 Not available in 480V under 50W

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URBAN SERIES

URBAN MICRO STRIKE

DELIVERED LUMENS

# of LEDs	SYSTEM WATTS	DISTRIBUTION TYPE	5K7 (5000K nominal, 70 CRI)					4K7 (4000K nominal, 70 CRI)					3K7 (3000K nominal, 70 CRI)				
			LUMENS	LPW	B	U	G	LUMENS	LPW	B	U	G	LUMENS	LPW	B	U	G
80L	24.4	2	3184	130.44	1	0	1	3049	124.91	1	0	1	3021	123.76	1	0	1
		3	3245	132.92	1	0	1	3107	127.28	1	0	1	3078	126.12	1	0	1
		4F	3236	132.58	1	0	1	3099	126.96	1	0	1	3071	125.79	1	0	1
		4W	3206	131.34	1	0	1	3070	125.77	1	0	1	3042	124.61	1	0	1
		5QW	3287	134.67	2	0	1	3148	128.96	2	0	1	3119	127.78	2	0	1
	36.9	2	4907	133.14	1	0	1	4699	127.5	1	0	1	4656	126.33	1	0	1
		3	5000	135.67	1	0	1	4788	129.92	1	0	1	4744	128.73	1	0	1
		4F	4988	135.32	1	0	1	4776	129.59	1	0	1	4732	128.4	1	0	1
		4W	4941	134.06	1	0	1	4731	128.37	1	0	1	4688	127.2	1	0	1
		5QW	5066	137.46	2	0	1	4852	131.64	2	0	1	4807	130.43	2	0	1
	47.2	2	6197	131.43	1	0	1	5934	125.85	1	0	1	5880	124.7	1	0	1
		3	6315	133.93	1	0	1	6047	128.25	1	0	1	5991	127.07	1	0	1
		4F	6298	133.58	1	0	1	6031	127.92	1	0	1	5976	126.74	1	0	1
		4W	6239	132.33	1	0	1	5975	126.72	1	0	1	5920	125.56	1	0	1
		5QW	6398	135.69	2	0	1	6127	129.94	2	0	1	6070	128.75	2	0	1
	64.7	2	8378	129.45	1	0	2	8023	123.96	1	0	2	7949	122.83	1	0	2
		3	8538	131.92	1	0	2	8176	126.32	1	0	2	8101	125.16	1	0	2
		4F	8516	131.58	1	0	2	8155	126	1	0	2	8080	124.84	1	0	2
		4W	8436	130.35	1	0	2	8078	124.82	1	0	2	8004	123.67	1	0	2
		5QW	8650	133.66	2	0	2	8284	127.99	2	0	2	8207	126.81	2	0	2
	90.1	2	10927	121.29	2	0	2	10464	116.15	2	0	2	10368	115.08	2	0	2
		3	11135	123.6	2	0	2	10663	118.36	2	0	2	10565	117.27	2	0	2
		4F	11107	123.28	2	0	2	10636	118.06	2	0	2	10538	116.97	2	0	2
		4W	11003	122.13	2	0	2	10536	116.95	2	0	2	10439	115.88	2	0	2
		5QW	11282	125.23	2	0	2	10804	119.92	2	0	2	10705	118.82	2	0	2
	111.9	2	12779	114.19	2	0	2	12237	109.35	2	0	2	12125	108.34	2	0	2
		3	13022	116.36	2	0	2	12470	111.43	2	0	2	12355	110.4	2	0	2
		4F	12988	116.06	2	0	2	12438	111.14	2	0	2	12323	110.12	2	0	2
		4W	12867	114.97	2	0	2	12321	110.1	2	0	2	12208	109.09	2	0	2
		5QW	13194	117.9	2	0	2	12634	112.9	2	0	2	12518	111.86	2	0	2

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URBAN SERIES

URBAN MICRO STRIKE

DELIVERED LUMENS

# of LEDs	SYSTEM WATTS	DISTRIBUTION TYPE	5K7 (5000K nominal, 70 CRI)					4K7 (4000K nominal, 70 CRI)					3K7 (3000K nominal, 70 CRI)				
			LUMENS	LPW	B	U	G	LUMENS	LPW	B	U	G	LUMENS	LPW	B	U	G
160L	116.8	2	15157	129.79	2	0	2	14514	124.28	2	0	2	14381	123.14	2	0	2
		3	15445	132.26	2	0	2	14790	126.65	2	0	2	14654	125.49	2	0	2
		4F	15405	131.92	2	0	2	14752	126.32	2	0	2	14617	125.16	2	0	2
		4W	15261	130.68	2	0	2	14614	125.14	2	0	2	14480	123.99	2	0	2
		5QW	15649	134	2	0	2	14985	128.32	2	0	2	14848	127.14	2	0	2
	135.9	2	17195	126.52	2	0	2	16466	121.15	2	0	2	16315	120.04	2	0	2
		3	17522	128.92	2	0	2	16779	123.46	2	0	2	16625	122.32	2	0	2
		4F	17477	128.59	2	0	2	16736	123.14	2	0	2	16582	122.01	2	0	2
		4W	17313	127.39	2	0	2	16579	121.99	2	0	2	16427	120.87	2	0	2
		5QW	17753	130.63	2	0	2	17001	125.09	2	0	2	16845	123.94	2	0	2
	163.6	2	19890	121.55	3	0	3	19047	116.4	3	0	3	18872	115.33	3	0	3
		3	20269	123.86	3	0	3	19409	118.61	3	0	3	19231	117.52	3	0	3
		4F	20217	123.54	3	0	3	19359	118.3	3	0	3	19182	117.22	3	0	3
		4W	20027	122.39	3	0	3	19178	117.2	3	0	3	19002	116.12	3	0	3
		5QW	20536	125.5	3	0	3	19665	120.18	3	0	3	19485	119.07	3	0	3
	180.7	2	21414	118.54	3	0	3	20506	113.51	3	0	3	20318	112.47	3	0	3
		3	21821	120.79	3	0	3	20896	115.67	3	0	3	20704	114.61	3	0	3
		4F	21765	120.48	3	0	3	20842	115.37	3	0	3	20651	114.31	3	0	3
		4W	21561	119.35	3	0	3	20647	114.29	3	0	3	20458	113.24	3	0	3
		5QW	22109	122.39	3	0	3	21172	117.2	3	0	3	20977	116.12	3	0	3

ELECTRICAL DATA

# of LEDS	80					
NOMINAL WATTAGE	25	39	50	70	90	110
SYSTEM POWER (W)	24.4	36.9	47.2	64.7	90.1	111.9
Input Voltage (V)	CURRENT (AMPS)					
120	0.21	-	0.4	0.54	0.75	0.94
208	0.12	0	0.23	0.31	0.43	0.54
240	0.11	0	0.2	0.27	0.38	0.47
277	0.09	0	0.17	0.23	0.33	0.41
347	0.07	0	0.14	0.19	0.26	0.32
480	0.05	0	0.1	0.14	0.19	0.23

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URBAN SERIES

URBAN MICRO STRIKE

ELECTRICAL DATA CONTINUED

# of LEDS	160			
NOMINAL WATTAGE	115	135	155	175
SYSTEM POWER (W)	116.8	135.9	163.6	180.7
Input Voltage (V)	CURRENT (AMPS)			
120	0.97	1.13	1.37	1.51
208	0.56	0.65	0.79	0.87
240	0.49	0.57	0.68	0.75
277	0.42	0.49	0.59	0.65
347	0.34	0.39	0.47	0.52
480	0.24	0.28	0.34	0.38

Micro Strike Lumen Multiplier			
CCT	70CRI	80CRI	90CRI
2700K	-	0.82	-
3000K	0.949	0.817	0.614
3500K	-	0.9	-
4000K	0.958	0.887	0.669
5000K	1	0.937	0.791
Monochromatic Amber Multiplier			
Amber	0.25	-	-
Phosphor Coated Amber Multiplier			
AP	.71	-	-

EPA

EPA: X.XX sqft		Weight (lbs.)	PM	SM	YM
CAP	21	35 lbs.	1.04	1.14	1.39
	26	40 lbs.	1.39	1.49	1.79
MAR	21	35 lbs.	1.00	1.10	1.35
	26	40 lbs.	1.25	1.35	1.65
MRDS	21	35 lbs.	1.00	1.10	1.35
	26	40 lbs.	1.25	1.35	1.65
MRSS	26	40 lbs.	1.17	1.27	1.57

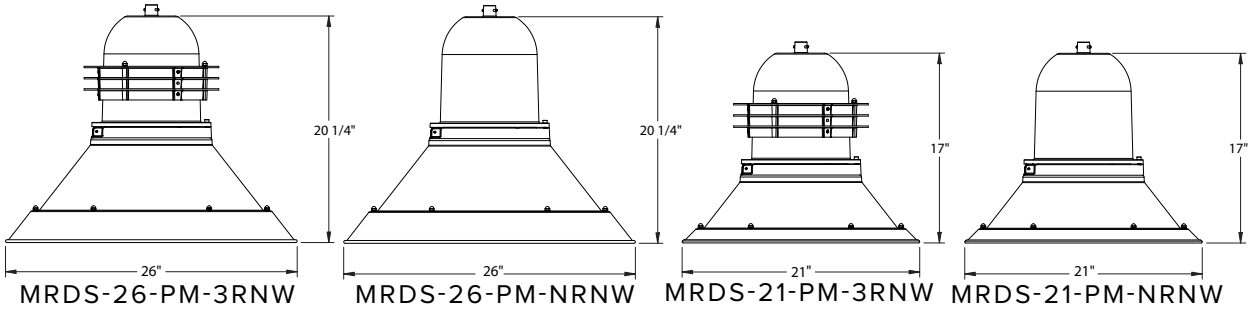
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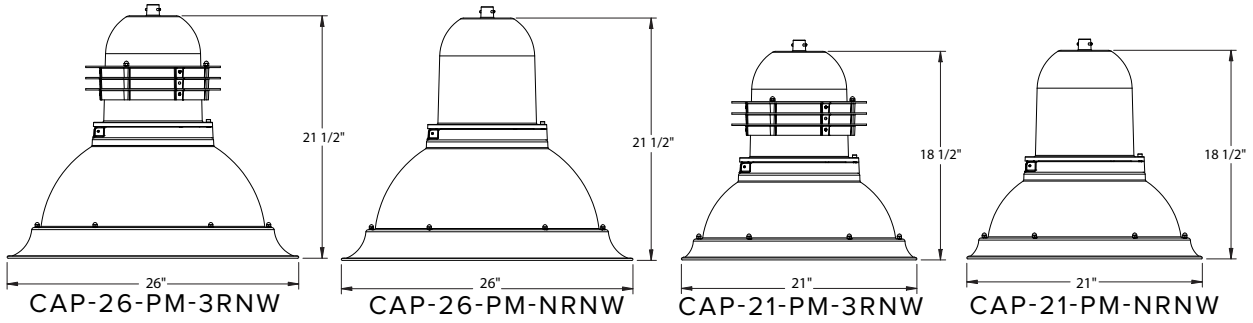
URBAN SERIES

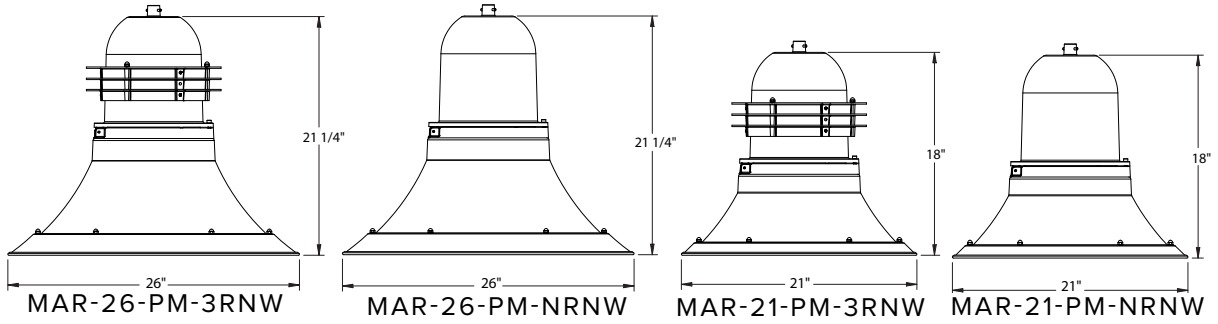
URBAN MICRO STRIKE

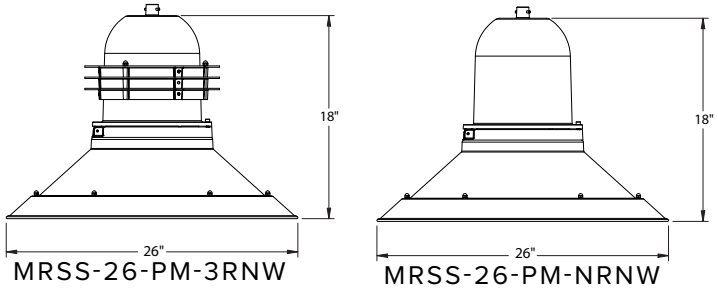
PENDANT MOUNT











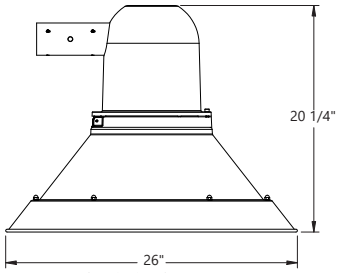
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URBAN SERIES

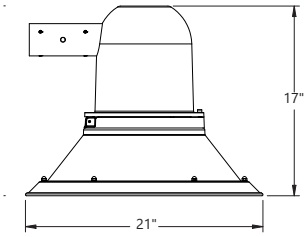
URBAN MICRO STRIKE

SIDE MOUNT

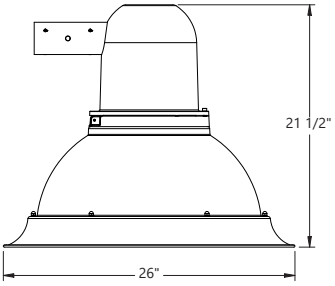




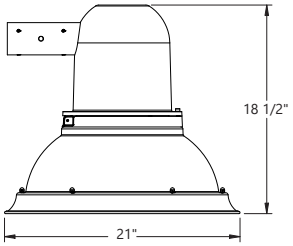
MRDS-26-SM-NRNW



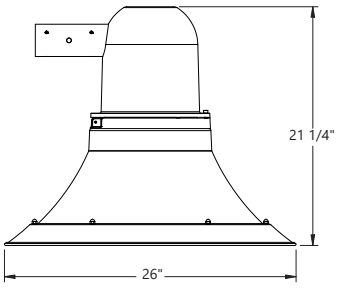
MRDS-21-SM-NRNW



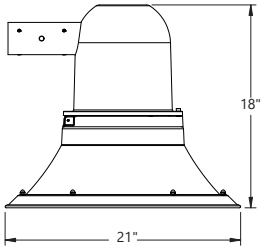
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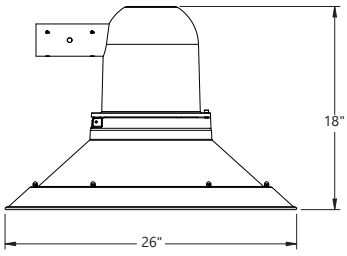
CAP-21-SM-NRNW



MAR-26-SM-NRNW



MAR-21-SM-NRNW



MRSS-26-SM-NRNW

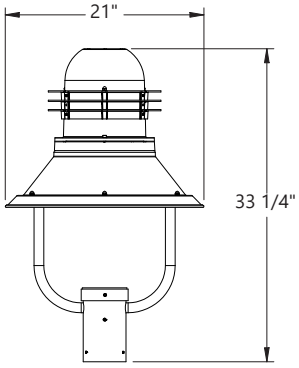
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URBAN SERIES

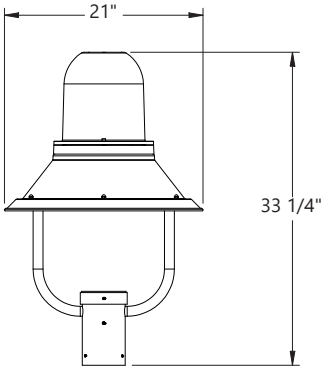
URBAN MICRO STRIKE

YOKE MOUNT - 2 STRUTS FOR 21"

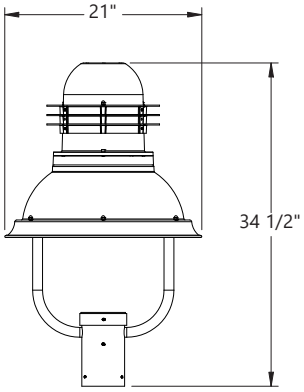




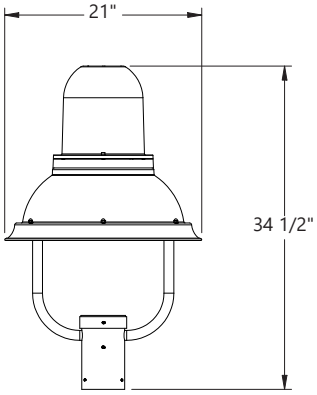
MRDS-21-YM-3RNW



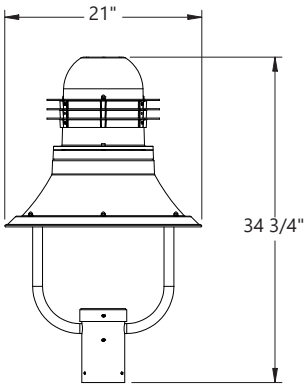
MRDS-21-YM-NRNW



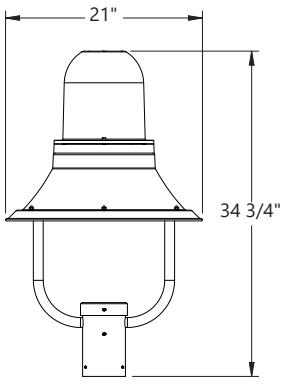
CAP-21-YM-3RNW



CAP-21-YM-NRNW



MAR-21-YM-3RNW



MAR-21-YM-NRNW

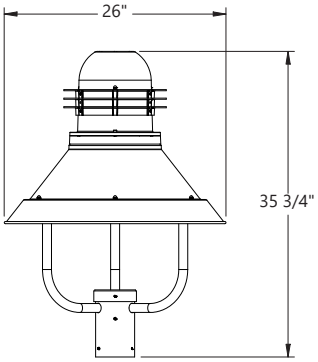
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URBAN SERIES

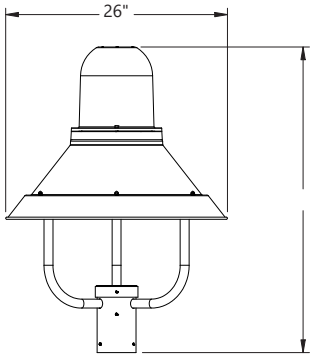
URBAN MICRO STRIKE

YOKE MOUNT - 3 STRUTS FOR 26" VERSION

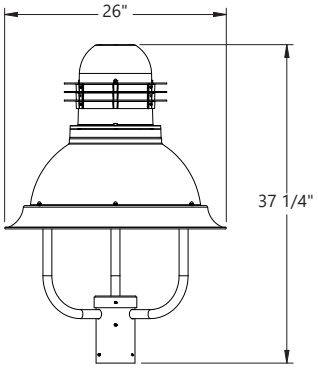




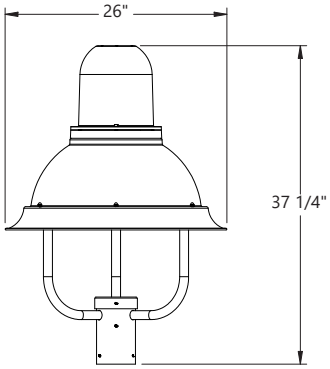
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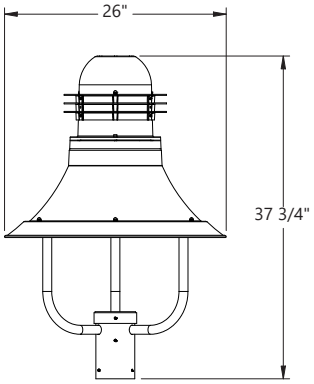
MRDS-26-YM-NRNW



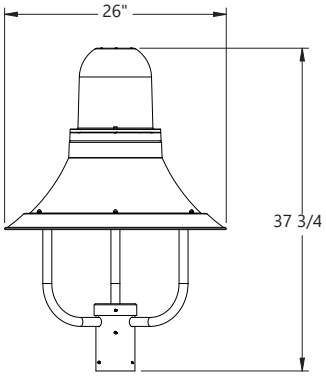
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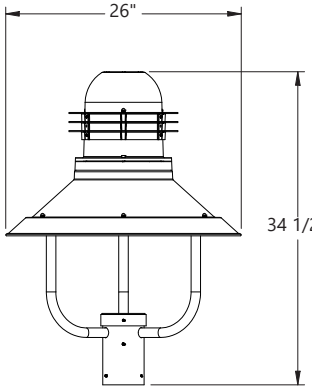
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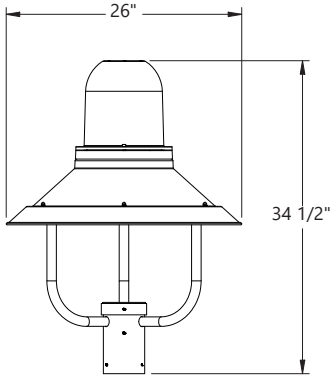
MAR-26-YM-3R



MAR-26-YM-NRNW



MRSS-26-YM-3R



MRSS-26-YM-NRNW

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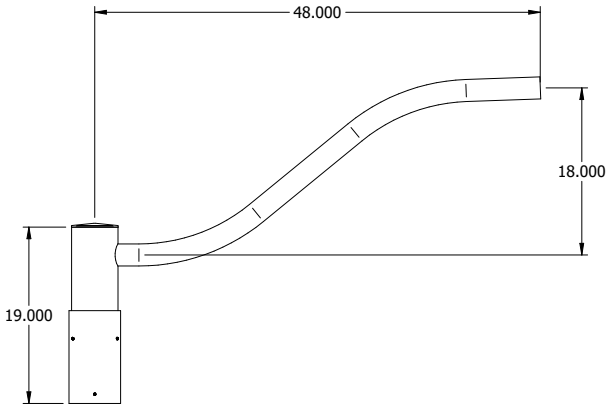
URBAN SERIES

URBAN MICRO STRIKE

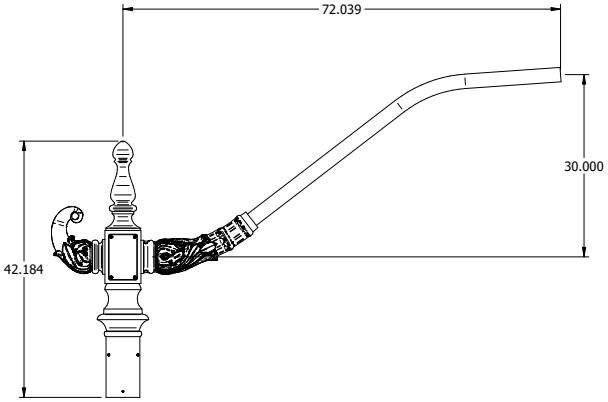
SIDE MOUNT

*** Arms ordered separately, arms mount over an open top pole, they do not mount to a tenon.**

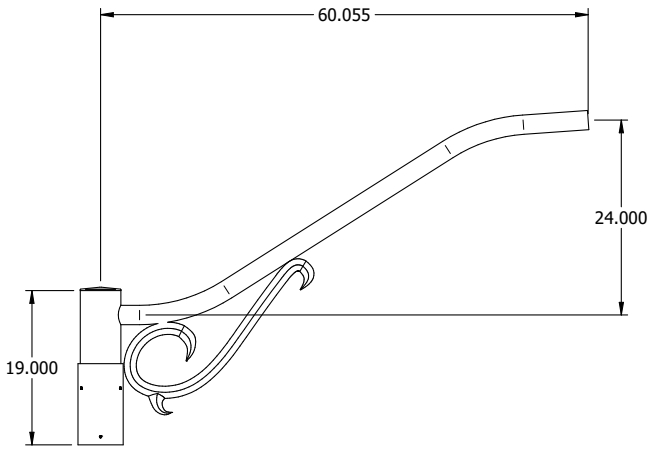




AA-10 COBRA



AA-10B COBRA BALBOA



AA-10S COBRA SCROLL

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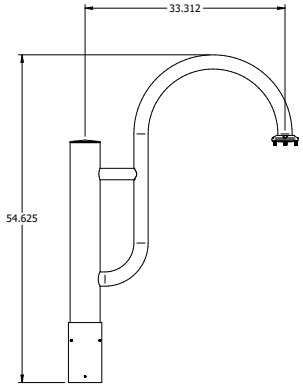
URBAN SERIES

URBAN MICRO STRIKE

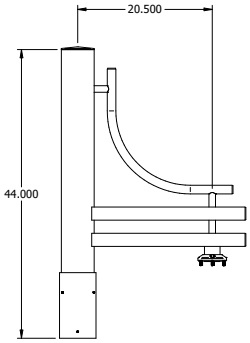
PENDANT MOUNT



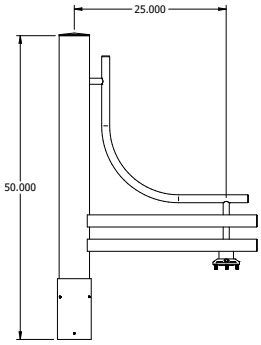
*** Arms ordered separately, arms mount over an open top pole, they do not mount to a tenon.**



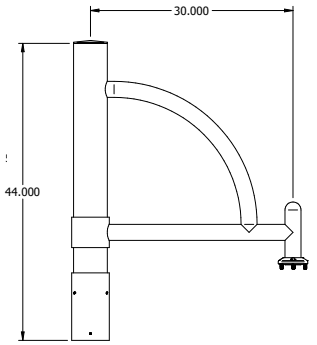
AA-42 RAILROAD SCS



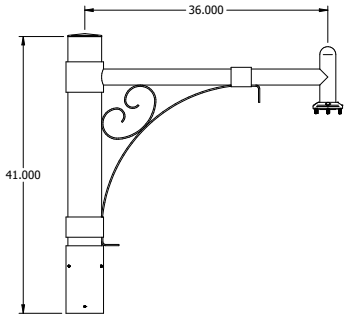
AA-40 SMALL PIERWALK



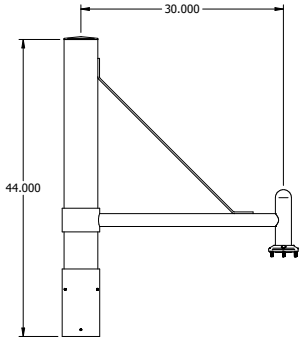
AA-38 LARGE PIERWALK



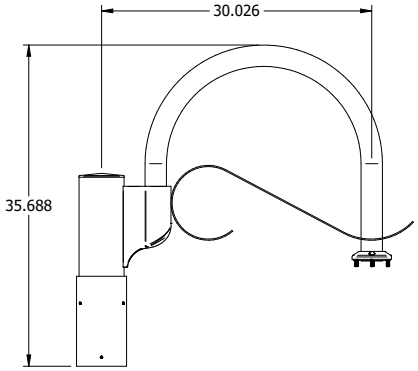
AA-49 RADIUS



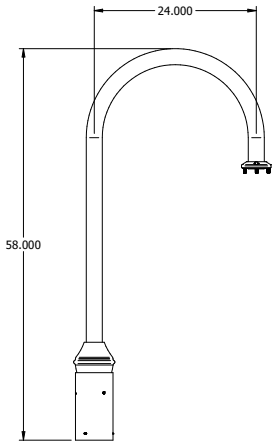
AA-27 STRATFORD



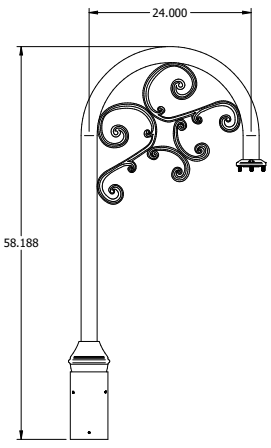
AA-44 STRUT



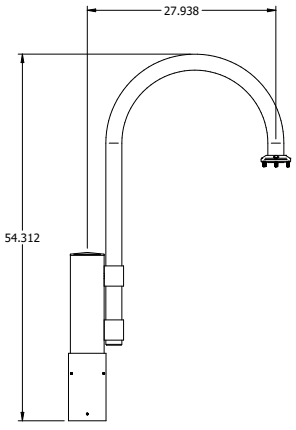
AA-45 TWIN EAGLES



AA-39 RAILROAD



AA-39S RAILROAD SCROLL



AA-41 RAILROAD STRAP

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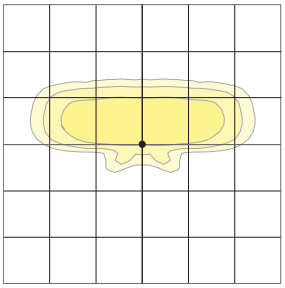
URBAN SERIES

URBAN MICRO STRIKE

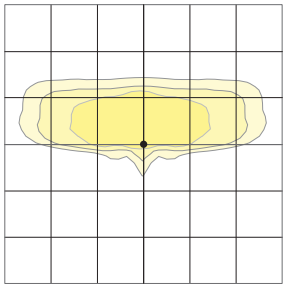
MICRO STRIKE PHOTOMETRY

The following diagrams represent the general distribution options offered for this product. For detailed information on specific product configurations, see website photometric test reports.

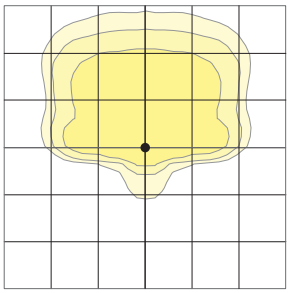
Type 2



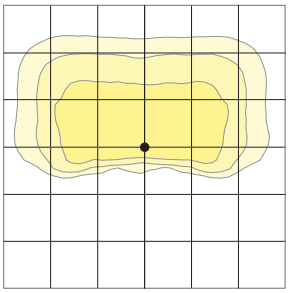
Type 3



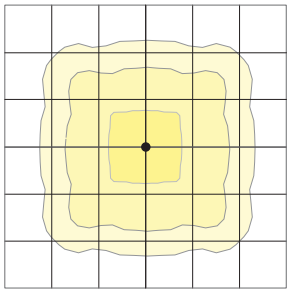
Type 4F



Type 4W



Type 5QW



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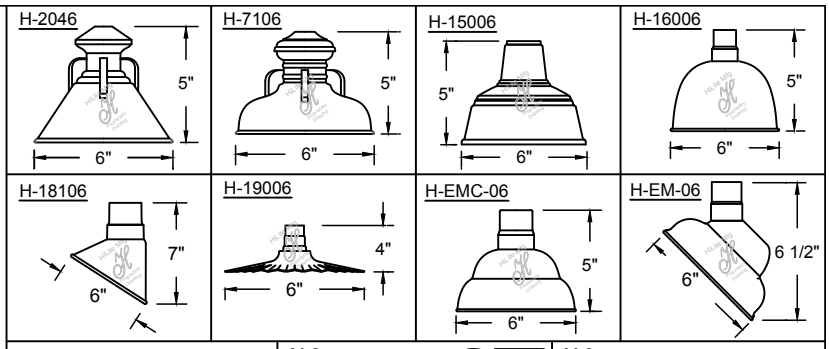
HI-LITE MFG. CO., INC.

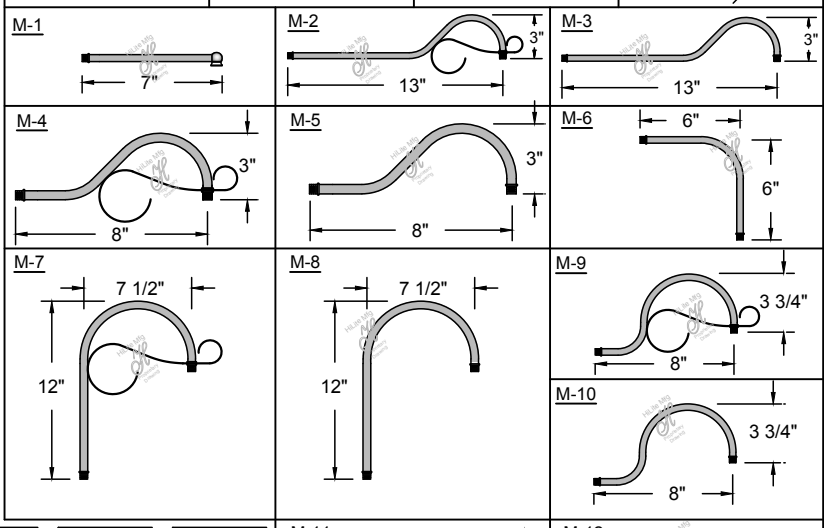
13450 Monte Vista Avenue
Chino, California 91710
Telephone: (909) 465-1999
Fax: (909) 465-0907

Job Name: _____

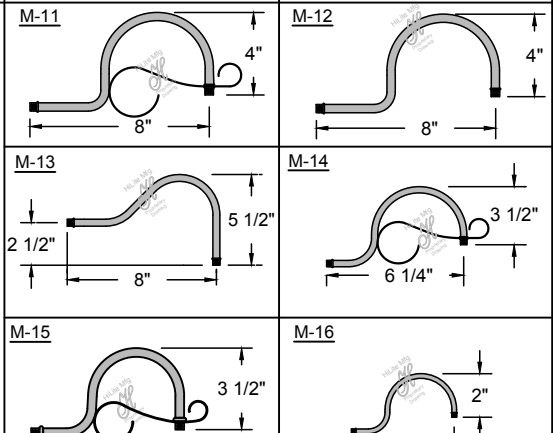
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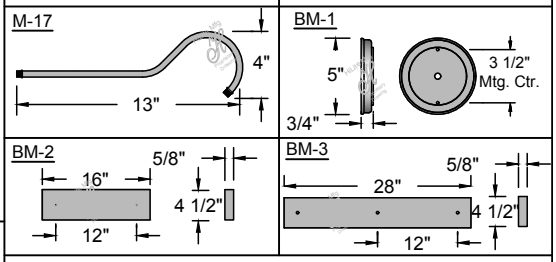
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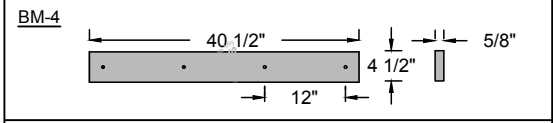


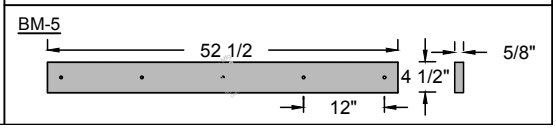


Fixture No.	– Fixture Color	/ Mounting	– Mounting Canopy	– Mounting Color	/ Wattage/ Voltage
H-2046 **H-7106** **H-15006** **H-16006** **H-18106** **H-19006** **H-EM-06** **H-EMC-06**	Standard **91** (Black) **93** (White) **95** (Dk. Grn) **96** (Galv.) **BR47** (Rust) Upgraded Finishes **BK01, GN20, 29, 66, 82, 92, 94, 97, 100, 103, 104, 105, 112, 113, 114, 117, 118, 119, 127, 128, 133, 134, 135, 136, 139, 140, 11, 01, 22, 25, 33, 77, 89**. For finish specs see pages 344-345	Cord Options **CB8** (8' Blk Cord) **CW8** (8' Wht Cord) **CG8** (8' Gray Mesh Cord) Stem Options **___ST1/8** (1/8 IPS Stem) Specify length and canopy. **STCSW** (Swivel Canopy) **STC** (Canopy) Flush Mount Options **FHSC** **FSMC** For specs see pages 336-343. Arm Options M-1 M-10 M-2 M-11 M-3 M-12 M-4 M-13 M-5 M-14 M-6 M-15 M-7 M-16 M-8 M-17 M-9	**(For Brackets only)** **BM-1** **BM-2** **BM-3** **BM-4** **BM-5**	Standard **91** (Black) **93** (White) **95** (Dk. Grn) **96** (Galv.) **BR47** (Rust) For all finishes see pages 344-348.	Incandescent (1) (Fixtures are standard 100W and 120V. Do not specify)









H-2046	– 91	/ M-13	– BM-1	– 91

ORDER EXAMPLE

(USE THIS FORMAT TO PLACE ORDER)

Notes:

(1) Socket Base: INC is medium base.

(2) For interior finish of fixture refer to color chart on pages 344-348. For copper and aluminum finishes loop arm and straight arm will be painted copper or painted aluminum.

Cord-hung fixtures: suitable for dry location only.
Stem-hung fixtures: suitable for damp & dry location.
Wall-Mount fixtures: suitable for damp & dry location.

Finish	Interior of Shade Finish	Finish Rating
01-Polished Brass	Satin Brass	Dry Rated
14-Satin Steel/ Satin Copper	Satin Steel	Dry Rated
15-Burnt Copper	Burnt Copper	Wet Rated
16-Burnt Steel	Burnt Steel	Dry Rated
22-Weathered Brass	Weathered Brass	Wet Rated
24-Satin Copper	Satin Copper	Wet Rated
25-Satin Brass	Satin Brass	Wet Rated
26-Natural Brass W/Clear Coat	Natural Brass W/Clear Coat	Wet Rated
29-French Green	White	Wet Rated
33-Patina	Patina	Wet Rated
41-Polished Brass/Polished Copper	Satin Brass	Dry Rated
44-Polished Brass	Satin Brass	Damp Rated
48-Raw Copper	Raw Copper	Wet Rated
49-Weathered Copper	Weathered Copper	Wet Rated
55-Chrome	Satin Chrome	Dry Rated
66-Navajo White	Navajo White	Dry Rated
74-Rosewood/Raw Copper accent	Rosewood	Wet Rated
77-Rosewood	Rosewood	Wet Rated
82-Sierra Wash	White	Wet Rated
89-Aged Brass	Aged Brass	Wet Rated
91-Black	White	Wet Rated
92-Yellow	White	Wet Rated
93-White	White	Wet Rated
94-Cruiser Green	White	Wet Rated
95-Dark Green	White	Wet Rated
96-Galvanized	Galvanized	Wet Rated
98-Polished Aluminum	Brushed Aluminum	Damp Rated
100-Dark Brown	White	Wet Rated
101-Brushed Aluminum	Brushed Aluminum	Wet Rated
102-Raw Aluminum	Raw Aluminum	Wet Rated
112-Tuscany	White	Wet Rated
117-Gun Metal Grey	White	Wet Rated
118-Painted Aluminum	Painted Aluminum	Wet Rated
119-Bronze	White	Wet Rated
121-Café	Café	Wet Rated
122-Transparent Green	Transparent Green	Wet Rated
123-Transparent Blue	Transparent Blue	Wet Rated
124-Transparent Red	Transparent Red	Wet Rated
127-Vanilla Cream	Vanilla Cream	Wet Rated
128-Painted Gold	Painted Gold	Wet Rated
130-Painted Natural Copper	Painted Natural Copper	Wet Rated
133-BK01/Brushed Gold	White	Dry Rated
134-BK01/Brushed Silver	White	Dry Rated
135-BK01/Brushed Copper	White	Dry Rated
136-BK01/Brushed Gold	White	Dry Rated
139-Cranberry	White	Wet Rated
140-Mallard Green	White	Wet Rated
141-Orange	White	Wet Rated
145-Oil Rubbed Bronze	White	Wet Rated
146-Navy Blue	White	Wet Rated
147-BattleShip Gray	White	Wet Rated
148-Caribbean Blue	White	Wet Rated
151-Old Copper	Old Copper	Wet Rated
152-Old Nickel	Old Nickel	Wet Rated
153-Bright Yellow	White	Wet Rated
154-Bright Red	White	Wet Rated
155-Bright Blue	White	Wet Rated
156-Bright Orange	White	Wet Rated
157-White w/Black Trim line	White	Wet Rated
158-Black Polished Copper	Polished Copper	Wet Rated
159-Gold Foil(For use with Interior of shade only)	Gold Foil	Dry Rated
160-Polished Nickel	Satin Nickel	Dry Rated
161-Copper Foil(For use with Interior of shade only)	Copper Foil	Dry Rated
162-Silver Foil(For use with Interior of shade only)	Silver Foil	Dry Rated
165-Powder Coat Brass	Powder Coat Brass	Wet Rated
991-High Gloss Black	White	Wet Rated
BK01-Black Texture	White	Wet Rated
BR47-Rust	White	Wet Rated
GN20-Powder Coat Patina	White	Wet Rated
COP/BLK-Copper/Black	White	Dry Rated
GLD/BLK-Gold/Black	White	Dry Rated
SIL/BLK-Silver/Black	White	Dry Rated

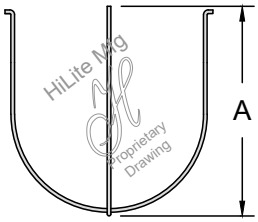
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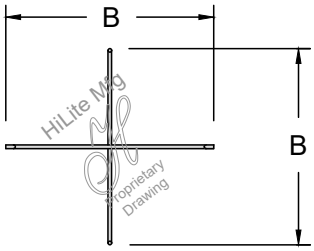
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Wire Guards, Cast Guard, Glass & Accessories

Drop Wire Guard

Item No.	Height (A)	Width (B)
DWG-1	3"	7"
DWG-2	4 1/2"	7"
DWG-3	5 1/2"	10"
DWG-4	8"	10"





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NORDIC
EW262106
WALL

PROJECT





EW262106-BK
Black

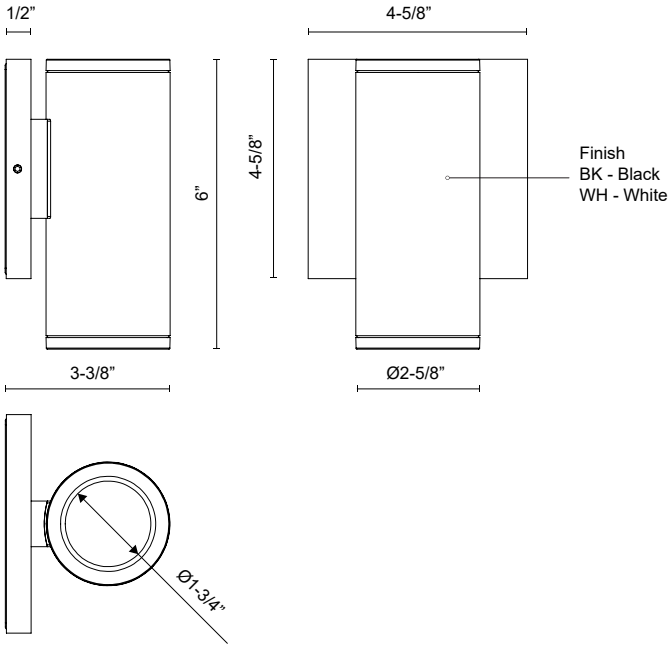


EW262106-WH
White

SPECIFICATION DETAILS

Fixture Dimensions	W4-5/8" x H6" x E3-3/8"
Height From Center	3-3/4"
Light Source	AC LED Module
Wattage	8W
Total Lumens	680lm
Delivered Lumens	BK-458lm; WH-480lm
Voltage	120V
Color Temperature	3000K
CRI (Ra)	90CRI
Optical Details	Multi-Facetted Aluminum Reflector
Lens Details	Clear Glass
LED Rated Life	50,000 hours
Dimming Percentage	100% - 10%
Dimming Type	ELV Dimmer (Not Included)
ADA Compliant	Yes
Location	Wet, IP65
Canopy Dimensions	W4-5/8" x H4-5/8" x H1/2"
Paint Finish	BK02, WH02
Material	Aluminum + Glass
Illumination Direction	Up or Down
Mounting Style	All Orientation; Wall
DarkSky Approved	Yes, Mounting in Down Direction; 3000K CCT or Below

*For custom options, consult factory for details.
*For warranty information, please visit www.kuzcolighting.com/warranty



KUZCO

CANADA: 19054 28TH AVENUE - SURREY, BC V3Z 6M3

USA: 3035 E. LONE MOUNTAIN ROAD - LAS VEGAS, NV 89081

WWW.KUZCOLIGHTING.COM

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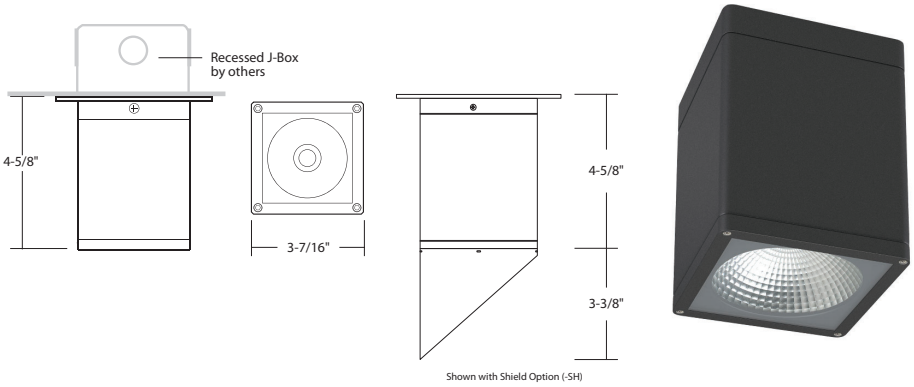
ETL LISTED C US Intertek

TYPE PROJECT

CATALOG#

DLQ340 : 4" SQUARE

CEILING DOWNLIGHT (IP65) 1000LM-1500LM (10W-15W)



US Assembled · Emergency Backup · Wet · Motion/Daylight Sensor

IK08 · Intertek · Outdoor · Ambient Light

Tamper Resistant · Cold Weather · Dark Sky · Quickship

RGB+W Option · IP65 · 120V · 277V

- Energy efficient, low glare LED Chip-On-Board light engine
- Beam spreads include NS, SP, FL, WFL and Pencil Beam
- Wall Wash Optics available
- Emergency back up available
- Integral Surface J-Box Option
- 5-Year Limited Warranty
- IK08 Rated

ORDERING : DLQ340B-L15-B10UE-DUN-EMA-T30-SDL

DLQ340

Fixture | Finish | Lumen | Optics | Control | Emergency Options | LED | Options

Finish

White	(RAL 9003)	**W**
Silver	(RAL 7037)	**S**
Bronze	(RAL 8019)	**BZ**
Black	(RAL 9005)	**B**
Light Silver	(RAL 7036)	**LS**[10]
Dark Grey	(RAL 7015)	**DG**[10]
Metallic Gold	(RAL 1001)	**MG**[10]
Metallic Black	(RAL 7021)	**MB**[10]

Lumen

1000lm (10W)	**Blank**
1500lm (15W)	**-L15**

Optics

Standard Beams	
Wide Flood	**Blank**
Narrow Spot	**-B10**
Spot	**-B20**
Flood	**-B45**
CleanBeam™ Option	
10° Pencil Beam	**-CB10**
Specialty Beams	
Wall Wash	**-BWW**
Asymmetric (30° x 60°)	**-B3060**

Control[9]

Non-Dimming (120V)	**Blank**
TRIAC/ELV Dimming (120V)	**-DIN**
0-10V Dimming (120V/277V)	**UE-D10**
UniDim™ 0-10V, TRIAC/ELV Dimming (120V/277V)	**UE-DUN**
1% , 0-10V Dimming (120V/277V)	**UE-D10P1**
UniSense - Integral Motion/ Photosensor (120V)	**-SUN-INT**[12]
UniSense - Integral Motion/ Photosensor (120V/277V)	**-SUN-INT-1227**[12]
Casambi Wireless Dimming	**-DCSM**[12]
BubblyNet Wireless System	**-DBNT**[13]
SimplySnap Wireless System	**-DSYN**[14]

Emergency Options

None	**Blank**
Remote Location Emergency System	**-EMAC**
Emergency in Canopy for Surface Mounted Fixture	**-EMA**[1,6,7]
Emergency in Canopy for Pendant Mounted Fixture	**-EMA/PM**[1,6,7,8]

LED

4000K (90 CRI)	**Blank**
2700K (90 CRI)	**-T27**
2700K (97 CRI)	**-T27-C97**[2]
3000K (90 CRI)	**-T30**
3000K (97 CRI)	**-T30-C97**[2]
3500K (90 CRI)	**-T35**
5000K (80 CRI)	**-T50**
RGB+W Control (24VDC)	**-RGBWV24**[4]

Options

None	**Blank**
Hex-Cell Louver	**-LVR**[11]
Photocell Sensor	**-SDL**
Integral J-Box	**-JB**[5]
Surge Protector	**-SRG**
Cold Weather	**-CW**[3,7]
Frosted Lens	**-FR**
Glare Shield	**-SH**
Marine Grade Finish	**-MGD**[2]

[1] -EMA and -EMA/PM for 15W max.
[2] Special Order. Minimum order, extended lead time may apply. Consult factory.
[3] Starting temperature -30°C/-22°F; see p. 6.
[4] Remote Power Supplies and Control Gear Required. Available with Wireless Bluetooth or DMX Control. Consult Factory for Details.
[5] See p. 5 for breakdown of -JB options.
[6] Standard option only available for Black (B), and White (W) finish. For alternate finishes. Contact factory for pricing. Extended lead time may apply.
[7] (-EMA) and (-EMA/PM) are not compatible with (-CW) option.
[8] Must be ordered with Pendant Mount Accessory (LPCMDL4) shown on p. 5.
[9] 347V Input with 0-10V Dimming available. Consult factory for lead times.
[10] Special Order Finish. Minimum order quantity (MOQ) applies. Orders less than MOQ are subject to a special paint set-up fee for the quantity ordered. Extended lead times may apply. Consult Factory.
[11] (-LVR) Hex-Cell Louver is not available with CleanBeam Option (-CB10).
[12] Must be ordered with (-JB).
[13] Special Order. (-EMA), (-EMA/PM), and (-JB) are not compatible with (-DBNT) option.
[14] Special Order. Sent with surface mount JBOX to allow for direct-conduit entry.

Custom RAL Color: Please note that we appreciate custom finishes. Custom finishes are subject to a special paint setup fee for the quantity ordered. Extended lead times may apply. Consult Factory.

DLQ340 : 4" SQUARE

CEILING DOWNLIGHT (IP65) 1000LM-1500LM (10W-15W)

SPECIFICATION

Application

This DL series covered ceiling mount downlight can be used for surface ceiling or pendant mount in both interior and outdoor settings. Typical locations are in commercial and retail spaces that require lighting from above. Dark sky compliant.

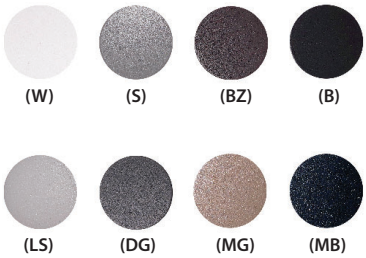
Housing

Housing is constructed of one piece high grade aluminum extrusion (Alloy 6061<.04% Cu). Faceplate (with tempered glass lens) and top cap are of a robust die cast aluminum alloy and seal the housing top and bottom. Faceplate has a silicone o-ring to seal the flush lens and threads into housing. A U-bracket installs onto an electrical junction box and secures into the top cap with two (2) flat head countersunk phillips head stainless steel screws.

Mounting:

Bracket supplied to install onto a 4" octagonal electrical junction box. For other junction box sizes see installation instructions.

Finish:



A 7-stage electrostatic, polymer process provides an outdoor textured powder coat finish that delivers outstanding durability, superior anti-aging, resistance to corrosion and UV-degradation. Consult factory for Custom Color. (More Information)

Standard Finishes:

White:	*RAL 9003*	(W)
Silver:	*RAL 7037*	(S)
Bronze:	*RAL 8019*	(BZ)
Black:	*RAL 9005*	(B)

Special Order Finishes:

Light Silver:	*RAL 7036*	(LS)
Dark Gray:	*RAL 7015*	(DG)
Metallic Gold:	*RAL 1001*	(MG)
Metallic Black:	*RAL 7021*	(MB)

Marine Grade**:**

The fixture features a marine-grade textured powder coat finish engineered to withstand extreme environmental conditions, including prolonged exposure to UV radiation, salt air, and moisture, which are prevalent in coastal and high-humidity environments.

A multi-stage surface preparation, finishing, and curing process ensures maximum adhesion, durability, and corrosion resistance. The coating system undergoes rigorous salt spray (ASTM B117) testing, overbake resistance verification, and pencil hardness testing to validate its robustness against degradation.

The marine-grade powder coat is applied as a 30–50 µm bottom layer, providing a strong anti-corrosion foundation. This is further enhanced by a surface coat using a standard architectural-grade powder application with a total thickness of 80–120 µm, ensuring superior resistance to wear, impact, and environmental stressors.

Certifications and Listings:



ETL / cETL Listed to UL1598 and UL8750 standards.

Suitable wet locations. (IP65)

Assembled in USA.

IK08 rated for impact resistance.

SPECIFICATION (Continued)

Caution:

LITON recommends use of surge protectors on the power entering LED Housings.
Surge damage is not covered by warranty. (See option SRG)

Warranty

Covered by a 5-Year Warranty to be free of defects in materials and craftsmanship. Fixture should not be installed in applications with ambient temperature above 50°C/122°F. Doing so will result in reduced lamp life and voided warranty.

Optics

Multifaceted aluminum reflector produces low glare illumination with multiple light control options.

Standard Beam:

Used for maximum light output and visible field angle.

LED

COB (Chip on Board) singular LED light source provides for smooth, uniform light output, eliminating the imaging produced by multiple LED source optics.

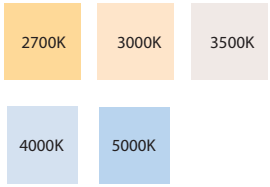
Lumen Maintenance:

Lumen Maintenance is aminimum 50,000 hours L70 life based on ANSI TM-21 calculations from LM80 standardized test results.

Lumen Options (Nominal):

1000lm (10W) (Blank)
1500lm (15W) (-L15)

Color Temperature:



Binned with 4-step MacAdam ellipses as per ANSI Standard recommendation.

COLOR TEMP:	2700K	3000K	3500K	4000K	5000K
CRI:	90, 97	90, 97	90	90	80

RGB+W:



15W RGBW LED Module Illuminates surfaces up to 10 feet away.Used for applications desiring a dynamic color changing effect. RGB+W design allows fine-tuned pastel colors and saturated hues without sacrificing illumination brightness. Can be set for static colors or dynamic shows. Multiple control options available with either Wireless Bluetooth control or DMX 512 remote mounted decoders.

On-site commissioning and programing available.

Consult Factory for Layout Assistance and Lead Times.

SPECIFICATION (Continued)

Emergency Options

When AC power fails, provides 90 minutes of power to the luminaire. In the event of a power failure, the LED Emergency backup switches to the emergency mode and operates the existing fixture for 90 minutes.

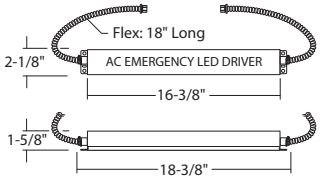
Remote Emergency Back Up (-EMAC):

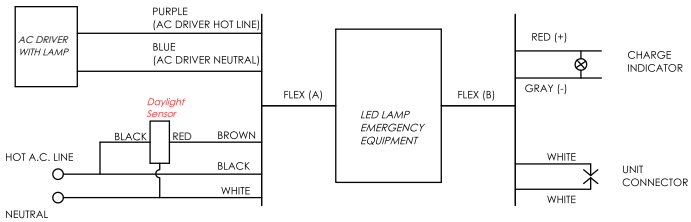
For installation away from the surface of the building in remote hidden location.

- Hidden Emergency Equipment
- Must be installed in Dry Locations

Not rated for outdoor mounting.

Damp location rated.

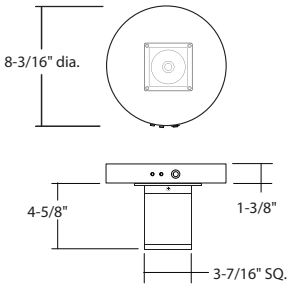




Input Voltage:	120-277VAC/60Hz
Output Voltage:	170VDC (120VAC Equivalent)
Wattage:	25W
Switching Time:	<1s
Charging Time:	24h
Operating Time:	90 minutes
Minimum Temperature:	0°C
Maximum Temperature:	50°C
Maximum Lumens:	2600lm

Emergency Backpack (-EMA):

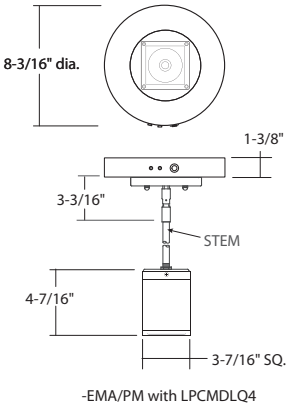
- The Emergency Backpack (-EMA) is 8" square, ceiling mount canopy, including EM components (recessed J-Box by others), a test switch and is field installed to the rear of the luminaire.
- Wet location rated.
- Covered Ceiling Mount.
- 1500lm max.
- For non-emergency fixtures requiring visual continuity use -EMA-Blank.



Voltage:	120-277VAC/60Hz
Wattage:	15W
Switching Time:	<1s
Charging Time:	24h
Operating Time:	90 minutes
Minimum Temperature:	-20°C
Maximum Temperature:	45°C
Maximum Lumens:	1500lm

Emergency Backpack (-EMA/PM):

- The Emergency Backpack for Pendant Mount (-EMA/PM) is 8" square, ceiling mount canopy, including EM components (recessed J-Box by others), a test switch and is field installed to the rear of the luminaire.
- Wet location rated.
- 1500lm max.
- Covered Ceiling Mount.
- For non-emergency fixtures requiring visual continuity use -EMA/PM-Blank.



-EMA/PM with LPCMDLQ4

Fixture is not available with a backplate on the Pendant Mount (-EM/PM Version)

Voltage:	120-277VAC/60Hz
Wattage:	15W
Switching Time:	<1s
Charging Time:	24h
Operating Time:	90 minutes
Minimum Temperature:	-20°C
Maximum Temperature:	45°C
Maximum Lumens:	1500lm

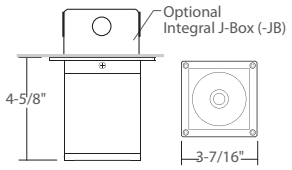
- For use only with pendant mounting kits: LPCMDLQ4, LPCMJDLQ4, LPCMCDLQ4 and LPCMCJDLQ4.

SPECIFICATION (Continued)

Additional Options

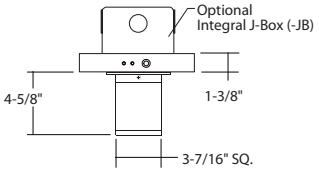
Optional J-Box (Direct Conduit Entry):

- The Integral Surface Mount Junction Box option (-JB) is a square J-Box pre-mounted to the rear of the luminaire to allow for direct conduit entry.
- For use with mounting locations without a recessed junction box.
- Factory installed outlet box with five (5) 1/2 NPSM trade conduit holes and plugs (1 top, 4 sides) for 1/2 in. trade conduit and wire entry.



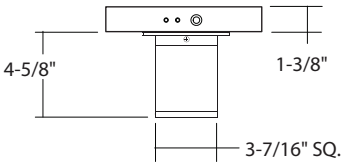
Configure as:
-JB: (5) conduit entry from left or right looking at fixture.

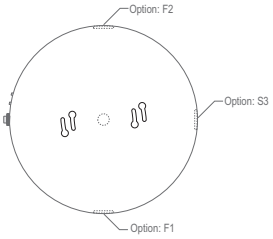
- The Emergency Backpack with a surface mount junction box (-EMA-JB) is a 8" ceiling mount canopy including EM components, Surface J-Box, a test switch and is field installed to the rear of the luminaire to allow for direct conduit entry.
- Wet Location Rated.
- Covered Ceiling Mount.
- 1500lm max.
- For Non-Emergency Fixtures requiring visual continuity use -EMA-Blank.



Configure as:
-EMA-JB

- The Emergency Backpack with 1/2" conduit openings (-EMA-JB-XX) is a 8" ceiling mount canopy including EM components, a test switch and is field installed to the rear of the luminaire with 1/2" trade conduit openings in the body of the ceiling mount canopy to allow for direct conduit entry.
- Wet Location Rated.
- Covered Ceiling Mount.
- 1500lm max.
- For Non-Emergency Fixtures requiring visual continuity use -EMA-Blank.





Configure as:
-EMA-JB-XX

Option:	Ø 7/8" Conduit Hole
F1	At any Direction
F1 - F2	Straight Connection
F1 - S3	L Connection
S3	T Connection

Photocell (/SDL):



Sensor enables automatic on/off operation based on ambient light levels, providing dusk-to-dawn functionality.
Power Consumption: .5W
Voltage: 120V, 277V
On/Off Levels: On @ 0-2fc / Off @ 2fc or more
Warranty: 2- Year / 5,000 Cycles
Sensor Size: 3/8"
Rating: UL/cUL

SPECIFICATION (Continued)

Surge Suppressor (/SRG):



Protects driver against surges in line voltage/current (20KV, 1.2/50µS & 10KA, 8/20µS).

Provides a positive indication of end-of-life by opening voltage to the load.

Surge suppressor is a perishable device requiring periodic replacement.

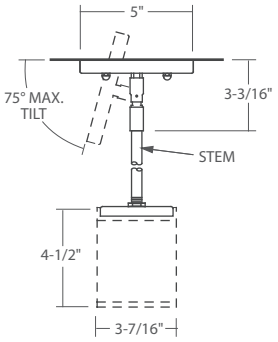
Not a warrantied item.

* Sent separately.

Number of Fixtures Wired in Series per Surge Protector			
Luminaire	Wattage Range (depends on lumen packages)	@120VAC Max. Load = 450W	@120VAC Max. Load = 1000W
DL340/DLQ340/DL340J	10W - 15W	30 - 45	65 - 100
DL360/DLQ360/DL360J	10W - 30W	15 - 45	30 - 100

Pendant Mounting:

See spec sheet LPCMDLQ4 for details and configuration





Configure as:
-JB: (5) conduit entry from left or right looking at fixture

Electrical

LED Driver: AC 50/60Hz Electronic Direct Current Class 2 driver integrally mounted.
Power Factor > 0.90. See Dimming Section for voltage and wiring.

Minimum Operating Temperature:
Standard: -10°C/14°F
Cold Weather Option: (-CW) -30°C/-22°F

SPECIFICATION (Continued)

Control Options

ELV and TRIAC Driver 120V (-DIN):

Compatible with electronic low voltage, and 2-Wire incandescent dimmers. Also known as leading edge, Reverse Phase, Forward Phase dimming. Allows smooth dimming down to 5% depending upon the dimmer's limitations.

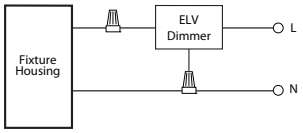
0-10V Driver 120V/277V (UE-D10):

Compatible with most existing 0-10V systems. Also known as fluorescent or 5-Wire dimming. Allows smooth dimming down to 5% depending upon the dimmer's limitations. Compatible with daylight harvesting controls.

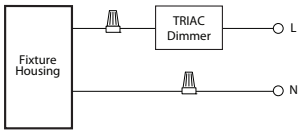
UniDim™ Driver 120V/277V (UE-DUN):

All in one ELV and TRIAC phase dimming (120V only), and 0-10V dimming (120V/277V). Works with most 3-Wire ELV, 2-Wire incandescent and 120V/277V 5-Wire 0-10V fluorescent dimmers.

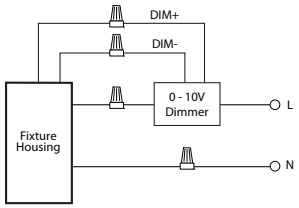
Incandescent/Phase Wiring
ELV



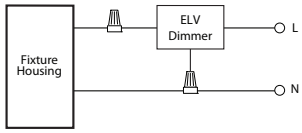
TRIAC



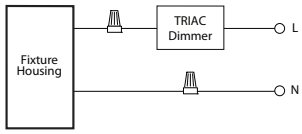
0 - 10V Wiring



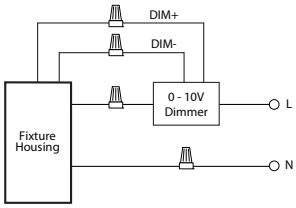
Incandescent/Phase Wiring
ELV



TRIAC



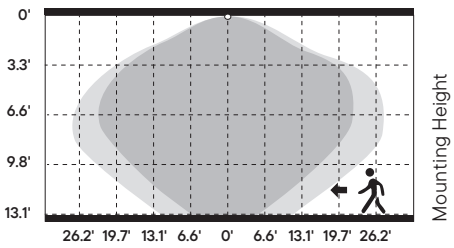
0 - 10V Wiring



Unisense™ PROGRAMMABLE MOTION + DAYLIGHT (-SUN-INT, -SUN-INT-1227)

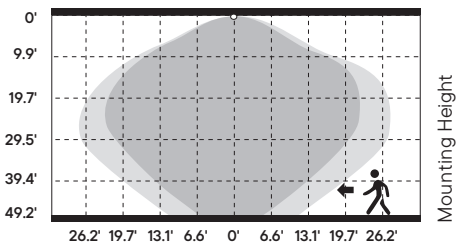
- Microwave and PIR (Passive Infrared) sensors depending on option
- Daylight harvesting
- Dusk/dawn sensing capabilities
- Motion Sensor

13' Height



13.1 ft max. distance with 100% sensitivity

50' Height



49.2 ft max. distance with 100% sensitivity

Well Detected Area Possibly Detected Area 1.6-3.3 ft/s

PHOTOMETRY – DLQ340 (L15)

Footcandle Distribution Cone Charts

STANDARD BEAM – WIDE FLOOD (Blank)

Height	Beam Diameter	Footcandle (FC)*
6.0'	7.9'	31.1
8.0'	10.5'	17.5
10.0'	13.1'	11.2
12.0'	15.8'	7.8
14.0'	18.4'	5.7

*at center of beam

STANDARD BEAM – NARROW SPOT (-B10)

Height	Beam Diameter	Footcandle (FC)*
6.0'	1.2'	457.1
10.0'	2.0'	164.6
14.0'	2.7'	84.0
18.0'	3.5'	50.8
20.0'	3.9'	41.1

*at center of beam

STANDARD BEAM – SPOT (-B20)

Height	Beam Diameter	Footcandle (FC)*
6.0'	2.1'	169.5
8.0'	2.8'	95.3
10.0'	3.5'	61.0
12.0'	4.1'	42.4
14.0'	4.8'	31.1

*at center of beam

STANDARD BEAM – FLOOD (-B45)

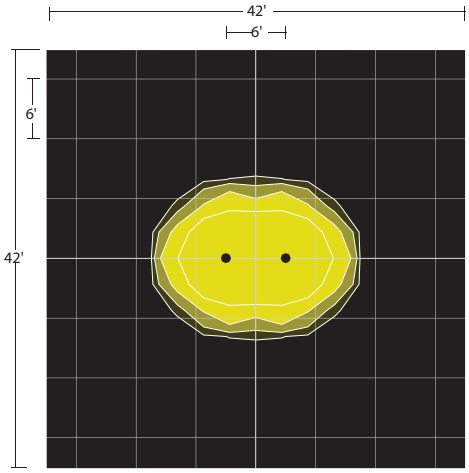
Height	Beam Diameter	Footcandle (FC)*
6.0'	3.8'	74.9
8.0'	5.1'	42.1
10.0'	6.4'	27.0
12.0'	7.6'	18.7
14.0'	8.9'	13.8

*at center of beam

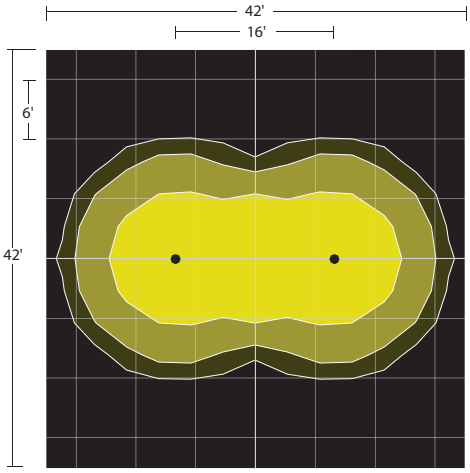
Footcandles On Ground (2 - Fixture Overlap)

5.0 fc 2.0 fc 1.0 fc .5 fc

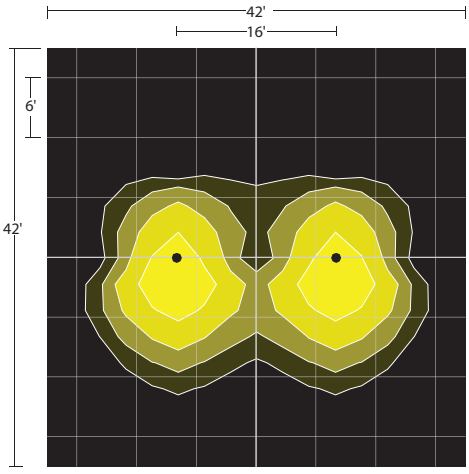
STANDARD BEAM – WIDE FLOOD (Blank)
8' Mounting



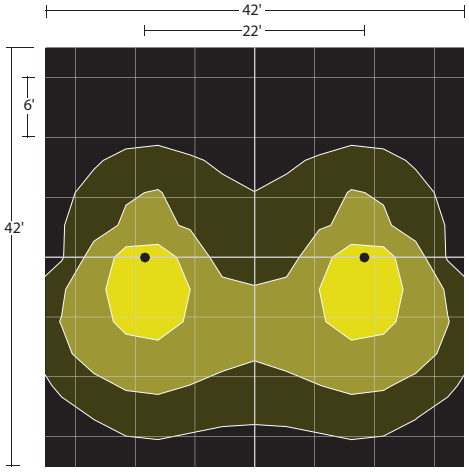
STANDARD BEAM – WIDE FLOOD
16' Mounting



SPECIALTY BEAM – TYPE IV (-BIV)
8' Mounting



SPECIALTY BEAM – TYPE IV (-BIV)
16' Mounting



2023.07.17

DLQ340 : 4" SQUARE

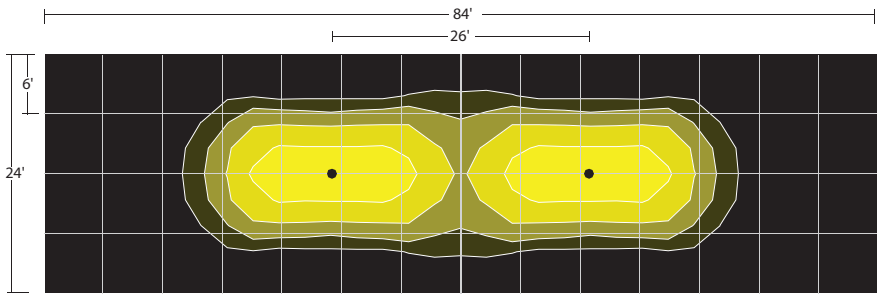
CEILING DOWNLIGHT (IP65) 1000LM-1500LM (10W-15W)

PHOTOMETRY – DLQ340 (L15) (Cont.)

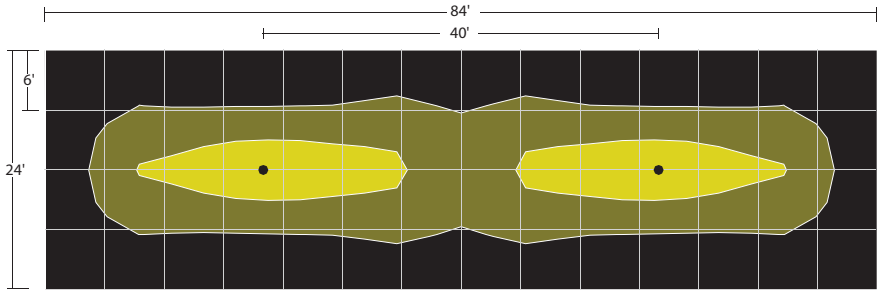
Footcandles On Ground (2 - Fixture Overlap)

5.0 fc 2.0 fc 1.0 fc .5 fc

SPECIALTY BEAM – TYPE II (-BII)
8' Mounting



SPECIALTY BEAM – TYPE II (-BII)
16' Mounting



LUMEN OUTPUT / LPW /BUG RATING

LM	W	Beam Spread	-T27 (2700K, 90 CRI)						-T30 (3000K, 90 CRI)						-T35 (3500K, 90 CRI)						Blank (4000K, 90 CRI)						-T50 (5000K, 80 CRI)					
			LM	LPW	cd	B	U	G	LM	L/W	cd	B	U	G	LM	LPW	cd	B	U	G	LM	LPW	cd	B	U	G	LM	LPW	cd	B	U	G
1000 lm	13.9	Wide Flood	760	55	1008	1	0	0	791	57	1050	1	0	0	802	58	1064	1	0	0	804	58	1066	1	0	0	958	69	1271	1	0	0
		-B02	175	13	567	0	0	0	182	13	590	0	0	0	184	13	598	0	0	0	185	13	600	0	0	0	220	16	715	0	0	0
		-CB20	362	26	839	1	0	0	377	27	874	1	0	0	382	27	886	1	0	0	383	28	888	1	0	0	456	33	1058	1	0	0
		-CB35	458	33	760	1	0	0	476	34	792	1	0	0	483	35	803	1	0	0	484	35	804	1	0	0	577	41	958	1	0	0
		-B10	1061	76	16461	1	0	0	1104	79	17138	1	0	0	1120	81	17378	1	0	0	1122	81	17410	1	0	0	1337	96	20748	1	0	0
		-B20	943	68	6023	1	0	0	981	71	6270	1	0	0	995	72	6358	1	0	0	997	72	6370	1	0	0	1188	85	7591	1	0	0
		-B45	926	67	2344	1	0	0	964	69	2440	1	0	0	977	70	2475	1	0	0	979	70	2479	1	0	0	1167	84	2954	1	0	0
		-BII	854	61	927	1	0	0	889	64	966	1	0	0	901	65	979	1	0	0	903	65	981	1	0	0	1076	77	1169	1	0	0
		-BWW	605	43	713	1	0	0	629	45	743	1	0	0	638	46	753	1	0	0	639	46	754	1	0	0	762	55	899	1	0	0
		-BIV	605	43	713	1	0	0	629	45	743	1	0	0	638	46	753	1	0	0	639	46	754	1	0	0	762	55	899	1	0	0
-L15 (1500 lm)	13.9	Wide Flood	1075	77	789	1	0	0	1119	81	821	1	0	0	1135	82	833	1	0	0	1137	82	835	1	0	0	1355	97	995	1	0	0
		-B02	236	17	429	0	0	0	246	18	447	0	0	0	249	18	453	0	0	0	250	18	454	0	0	0	297	21	541	0	0	0
		-CB20	501	36	655	1	0	0	522	38	682	1	0	0	529	38	691	1	0	0	530	38	693	1	0	0	632	45	825	1	0	0
		-CB35	638	46	594	1	0	0	664	48	619	1	0	0	673	48	627	1	0	0	675	49	628	1	0	0	804	58	749	1	0	0
		-B10	1303	94	11204	1	0	0	1356	98	11665	1	0	0	1375	99	11828	1	0	0	1378	99	11850	1	0	0	1642	118	14122	1	0	0
		-B20	1316	95	4320	1	0	0	1370	99	4498	1	0	0	1389	100	4561	1	0	0	1392	100	4569	1	0	0	1659	119	5445	1	0	0
		-B45	1285	92	2494	1	0	0	1338	96	2597	1	0	0	1356	98	2633	1	0	0	1359	98	2638	1	0	0	1620	117	3144	1	0	0
		-BII	1235	89	754	1	0	0	1286	93	784	1	0	0	1304	94	795	1	0	0	1307	94	797	1	0	0	1557	112	950	1	0	0
		-BWW	842	61	557	1	0	0	877	63	580	1	0	0	889	64	588	1	0	0	891	64	589	1	0	0	1059	76	700	1	0	0
		-BIV	842	61	557	1	0	0	877	63	580	1	0	0	889	64	588	1	0	0	891	64	589	1	0	0	1061	76	702	1	0	0

Type:
BEGA Product:
Project:
Modified:

Application
Designed to provide down lighting effects for interior and exterior locations featuring narrow beam light distribution.

Materials
Clear safety glass
Marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy
Silicone applied robotically to casting, plasma treated for increased adhesion
High temperature silicone gasket
Mechanically captive stainless steel fasteners
Pure anodized aluminum reflector

NRTL listed to North American Standards, suitable for wet locations
Protection class IP 64

Weight: 3.5 lbs.

Electrical

Operating voltage	120-277V AC
Minimum start temperature	-30° C
LED module wattage	4.0 W
System wattage	6.0 W
Controllability	0-10V dimmable
Color rendering index	Ra > 80
Luminaire lumens	318 lm
LED service life (L70)	60000 hrs

LED color temperature
☐ 4000K (K4)
☐ 3500K (K35)
☐ 3000K (K3)
☐ 2700K (K27)

BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish
All BEGA standard finishes are matte, textured powder coat with minimum 3 mil thickness. BEGA Unidure® finish provides superior fade protection in Black, Bronze, and Silver. BEGA standard White is a super durable polyester powder. Optionally available RAL, custom, and premium colors provided in polyester powder and/or liquid paint.

Available colors
☐ Black (BLK)
☐ Silver (SLV)
☐ Natural Bronze (NTB)
☐ CUS:
☐ Bronze (BRZ)
☐ White (WHT)
☐ RAL:

Available options

☐ AMB	Amber LED
☐ CUS	Custom finish
☐ DALI-2	Enabled for DALI control system
☐ FRO	Frosted lens
☐ FSC	Fusing
☐ MGU	Marine grade undercoat
☐ NTB	Natural bronze (premium finish)
☐ RAL	RAL Classic, matte finish
☐ SRG	Surge protection





Wall luminaire · Narrow beam downward

	LED	β	A	B	C
B33580	4.0 W	23°	$4^{3}/_{8}$	$7^{1}/_{2}$	5

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 info@bega-us.com

Due to the dynamic nature of lighting products and the associated technologies, luminaire data on this sheet is subject to change at the discretion of BEGA North America. For the most current technical data, please refer to bega-us.com
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Updated 06/12/26

Attachment M
Stormwater Report

STORMWATER MANAGEMENT REPORT

Tidewater Village TV3
Clearwater Drive
Falmouth, Maine

Submitted by:

Empire Development, LLC
417 Falmouth Road # 1
Falmouth, Maine 04105

Prepared by:

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

Date:
September 2026

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1.2 DESCRIPTION OF POINTS OF ANALYSIS..... 2
1.3 PRE DEVELOPMENT CONDITIONS 3
1.4 POST DEVELOPMENT CONDITIONS..... 3
1.5 BASIC STANDARDS..... 4
1.6 GENERAL STANDARDS..... 4
1.7 PHOSPHORUS STANDARD..... 5
1.8 URBAN IMPAIRED STREAM STANDARD 5
1.9 FLOODING STANDARD 5
1.10 CLOSURE 6

LIST OF APPENDICES

APPENDIX A SOILS REPORT
APPENDIX B PRE DEVELOPMENT CALCULATIONS
APPENDIX C POST DEVELOPMENT CALCULATIONS
APPENDIX D WATER QUALITY CALCULATIONS
APPENDIX E TEST PIT INFORMATION
APPENDIX F INSPECTION AND MAINTENANCE MANUAL

1.0 INTRODUCTION

Empire Development LLC is proposing to construct a mixed use commercial and residential development on a 3.10 acre parcel located off of Clearwater Drive in Falmouth (Map U52, Lot 6).

The scope of work includes but is not limited to:

- Construction of a multi-unit residential and mixed commercial buildings along Clearwater Drive and Willow Lane.
- Construction of driveways and parking to support the project
- Construction of municipal utility connections and stormwater management facilities

The proposed infrastructure improvements will create approximately 53,861 sf (1.24 acres) of new impervious area and 37,023 sf (0.85 acres) of new landscaped area totaling 90,884 (2.08 acres) of new developed area for the project.

Per Maine DEP chapter 500 regulations, as the project proposes greater than 1 acre but less than 5 acres of impervious area, the project must be permitted through DEP under a Stormwater Management Law Permit. Per these regulations, the project must meet the Basic and General treatment standards. See Sections 1.5 and 1.6 of this report for details on how these standards are met.

This project is serviced by Town of Falmouth municipal services for water, sewer and drainage. A closed drainage system exists on Clearwater Drive, with culvert entrances and connection stubs provided for the parcel at the time of Clearwater Drive's original construction, with the intention of providing municipal stormwater connections to this parcel. Following additional discussion with Falmouth's Town Engineer, the project must meet the requirements of Appendix 7-7 of Chapter II Section 7 of the Town Code of Ordinances, meeting existing peak discharge for the 2, 10, and 100 year events. The project must also reduce sediments and other pollutants, which is proposed through the use of BMP's. In regards to the closed drainage system along Clearwater Drive, the project has analyzed the run off to the system, and is proving a post-development condition where stormwater run off to the closed system is less than existing conditions, preserving capacity in the existing closed drainage system.

1.1 OVERVIEW OF MODELING METHODOGY AND SOURCE INFORMATION

Hydrologic Analysis: The pre and post development conditions have been modeled using modeling software (Hydrocad Version 10) which is based upon the methodology contained within the USDA Soil Conservation Service Technical

Release 55. Type III 24-hour storm distributions for Cumberland County Southeast region were used for the analysis. The following frequencies and 24-hour rainfall depths were used for the analysis:

Return Period	24-Hour Rainfall Depth
2-Year Storm	3.10 inches
10-Year Storm	4.60 inches
25-Year Storm	5.80 inches
100-Year Storm	8.10 inches

Soils: The soils boundaries used for the stormwater analysis were digitized from the Natural Resource Conservation Service (NRCS), web soil survey website. The source of the data is the Cumberland County Soil Survey (Class D). Refer to the following for additional documentation regarding the soils used for modeling:

- Appendix A of this Report
- Pre and Post Development Watershed Plans (Sheets A and B)

Soil Map Unit	Unit Description	Hydrologic Soil Group
Sn	Scantic silt loam, 0-3% slopes	D

Boundary Survey: Field survey by BH2M

Topography: On Ground Topography by BH2M

Natural Resources: Wetland delineations performed by Jones Associates

1.2 DESCRIPTION OF POINTS OF ANALYSIS

The existing and proposed stormwater run off for the project is captured by a closed drainage system along Clearwater Drive. This system features 2 culvert inlets to drain the existing wetland areas, and 2 drainage stubs that are currently not in use. To assess pre and post conditions, the analysis point has been placed at existing DMH G, the first manhole downstream of these inlets, to best assess changes in run off and connectivity from the project site. While there are additional offsite upstream inlets to the closed drainage system, these conditions only model run off from the TV3 project site for comparison of proposed conditions, and is not meant to portray all offsite upstream run off to the closed drainage system.

Analysis Point #1
Description: Run off from TV3 project site through DMH G
Pre-Development Tributary Drainage Areas: 3.68 acres
Post Development Tributary Drainage Areas: 3.68 acres

1.3 PRE DEVELOPMENT CONDITIONS

The Existing Conditions are shown on Sheet 2 and Sheet A of the accompanying plans. The project is bounded by Clearwater Drive, Willow Lane, Marigold Lane, and Farm Gate Road in Falmouth. The parcel lies within the watershed of the tidal section of the Presumpscot River at its outlet to Casco Bay. There are two wetland areas on site that drain through separate culvert entrances to the closed drainage system on Clearwater Drive. This closed drainage system then drains directly to Casco Bay.

The watershed that was analyzed for this project is approximately 3.68 acres. The analysis points are located along the eastern boundary of the parcel and are described in Section 1.2 of this report.

The Pre Development Stormwater plans are included as Sheet A of the accompanying plans and the Calculations are attached as Appendix B.

The Pre Development Watershed Model predicts the following peak flow rates:

Pre-Development Peak Flows (cu. ft./sec)				
Analysis Point	**2-Year**	**10-Year**	**25-Year**	**100-Year**
AP 1 (DMH G)	2.76	4.81	6.32	9.00

1.4 POST DEVELOPMENT CONDITIONS

The proposed project will include development mixed commercial and residential buildings, associated paved access road and parking, and stormwater treatment facilities. Below is a summary of the proposed impervious area for full build-out of the project.

Proposed Impervious Area	=	53,861 sf
Proposed Lawn Area	=	37,023 sf
Proposed Developed Area	=	90,884 sf

The proposed project includes a Grassed Underdrain Soil Filter, two Focalpoint high performance modular biofiltration systems, a dry Detention Pond, and a Roof Dripline Filter to provide water quality treatment and attenuation of peak flows for portions of the project. The design proposes to repurpose one of the existing culvert entrances to accept run off from the proposed on site closed drainage system, and the other to remain as existing as an outlet from the wetland to remain. An existing drain stub is proposed to be utilized to drain the Channel Protection Volume outflows from the proposed dry Detention Pond and a proposed catch basin.

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

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

Post-Development Peak Flows (cu. ft./sec)				
Analysis Point	**2-Year**	**10-Year**	**25-Year**	**100-Year**
AP 1 (DMH G)	2.32	3.61	4.44	8.95

1.5 BASIC STANDARDS

The proposed project is required to meet the Basic Standards. To meet the Basic Standards the project design must demonstrate that the erosion and sedimentation control, inspection and maintenance, and housekeeping standards specified in Appendices A, B, and C of 06-096 Chapter 500 are met, and that the grading or other construction activity will not impede or otherwise alter drainageways so as to have an unreasonable adverse impact on a wetland or waterbody, or an adjacent downslope parcel.

The proposed project will provide temporary (during construction) BMP's and post-construction BMP's. Refer to Sheet 5 of the project plans for erosion and sedimentation control narratives and details. The project requirements for inspection and maintenance during construction and post-construction are described in the Erosion and Sedimentation Control - Inspection and Maintenance Plan found in Appendix F of this Report. The housekeeping standards can also be found in the Inspection and Maintenance Plan.

1.6 GENERAL STANDARDS

The proposed project is required to meet Maine DEP Chapter 500 General Standards. To meet the general standards, the project design must demonstrate that the stormwater management system includes treatment measures that will provide pollutant removal or treatment and mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms and potential temperature impacts. This must be achieved by providing treatment of no less than 95% of the impervious area and no less than 80% of the developed area through DEP approved systems. Additionally, a treatment credit of 7,107 sf for impervious area, and 14,515 for developed area has been considered for treatment of existing untreated developed areas running onto the site.

The stormwater management system includes two Focalpoint high performance modular biofiltration systems, Roof Dripline Filter, Grassed Underdrained Soil Filter,

and a dry Detention Pond. The proposed BMP's have been designed in accordance with the design requirements outlined in the Maine Stormwater Best Management Practices Manual, Volume III and manufacturer's requirements.

Below is a summary of the treatment areas associated with the proposed infrastructure. Refer to the Treatment Plan Sheet C of the plan set and Appendix D for detailed calculations.

Treatment Summary	
Total Proposed Impervious Area	53,861 sf
Total Proposed Developed Area	90,884 sf
Total Treated Impervious Area	51,166 sf
Total Treated Developed Area	74,503 sf
Impervious Area Treatment %	**95.00% (95% required)**
Developed Area Treatment %	**81.98% (80% required)**

1.7 PHOSPHORUS STANDARD

The proposed project is located in the tidal portion of the Presumpscot River watershed. The proposed project is not located within the direct watershed of a lake or lake most-at-risk listed in 06-096 Chapter 502. The Phosphorus Standard does not apply to this project.

1.8 URBAN IMPAIRED STREAM STANDARD

The proposed project is located within the tidal portion of the Presumpscot River. The Presumpscot River is not listed in 06-096 Chapter 502 as an Urban Impaired Stream. The Urban Impaired Stream Standard does not apply to this project.

1.9 FLOODING STANDARD

The project must meet requirements of Maine DEP and the Town of Falmouth's Stormwater Management Plan standards. Additionally, the proposed project must demonstrate that increases in run off do not affect the overall capacity of the existing closed drainage system located on Clearwater Drive. To meet these requirements, the project must demonstrate that the stormwater management systems will accomplish the following:

a) The system must detain, retain, or result in the infiltration of stormwater from 24-hour storms of the 2-year, 10-year, 25-year and 100-year frequencies such that the peak flows of stormwater from the project site do not exceed the peak flows of stormwater prior to undertaking the project.

b) The design of piped or open channel systems must be based on a 10-year, 24-hour storm without overloading or flooding beyond channel limits.

c) The areas expected to be flooded by runoff from a 10-year, 25-year and 100-year, 24-hour storm must be defined, and no buildings or other similar facilities may be planned within such areas.

d) Runoff from the project may not flood the primary access road to the project and any public roads bordering the project as a result of a 100-year, 24-hour storm.

e) Discharge to a wetland due to a 2 year storm may not increase the mean storage the mean storage depth more than 2" above pre-development limits.

The following Table compares the Pre and Post Development peak flow rates for the 2-year, 10-year, 25-year, and 100-year return periods. Refer to Appendix B for the Pre Development model and Appendix C for Post Development model.

Peak Flow Comparison (cu. ft./sec)								
Analysis Point	**2-Year**		**10-Year**		**25-Year**		**100-Year**	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
AP 1 (DMH G)	2.76	2.32	4.81	3.61	6.32	4.44	9.00	8.95

Per discussions with the Town of Falmouth, the existing capacity of the stormwater system should not be impacted. The project uses DMH G, an existing drain manhole along Clearwater Drive as the analysis point to compare pre and post development conditions. The results of modeling show that peak run off is controlled on site to less than existing conditions at DMH G. Given that there are decreases in runoff with the 2-year, 10- year, 25-year, and 100-year events, the project is expected to have no impact on the capacity of the closed drainage system on Clearwater Drive by showing a net reduction in run off to the system.

Additionally, projects permitted under Maine DEP stormwater law must also demonstrate that additional run off to a wetland area must not increase the depth of the wetland by more than 2 inches. The results demonstrate that for the wetland area to remain, modeled as Pond "WET-2", stormwater runoff is expected to be reduced. Under 2-year event conditions, the existing conditions model shows a water surface elevation of 34.11, and 34.05 under proposed conditions, or a 0.72" reduction in water surface elevation in the wetland.

1.11 CLOSURE

The proposed stormwater management facilities have been designed to mitigate stormwater impacts associated with development of the proposed project. In accordance with Maine DEP and Town of Falmouth permit conditions, the project has been designed to meet the Basic, General and Flooding Standards.

Appendix A
Soils Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Cumberland County and Part of Oxford County, Maine

TV3



December 7, 2022

Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

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

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

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,390 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 19, Aug 30, 2022

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

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Sn	Scantic silt loam, 0 to 3 percent slopes	4.9	100.0%
Totals for Area of Interest		**4.9**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Cumberland County and Part of Oxford County, Maine

Sn—Scantic silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2slv3
Elevation: 10 to 900 feet
Mean annual precipitation: 33 to 60 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Scantic and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic

Setting

Landform: Marine terraces, river valleys
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciomarine deposits

Typical profile

Ap - 0 to 9 inches: silt loam
Bg1 - 9 to 16 inches: silty clay loam
Bg2 - 16 to 29 inches: silty clay
Cg - 29 to 65 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: F144BY304ME - Wet Clay Flat
Hydric soil rating: Yes

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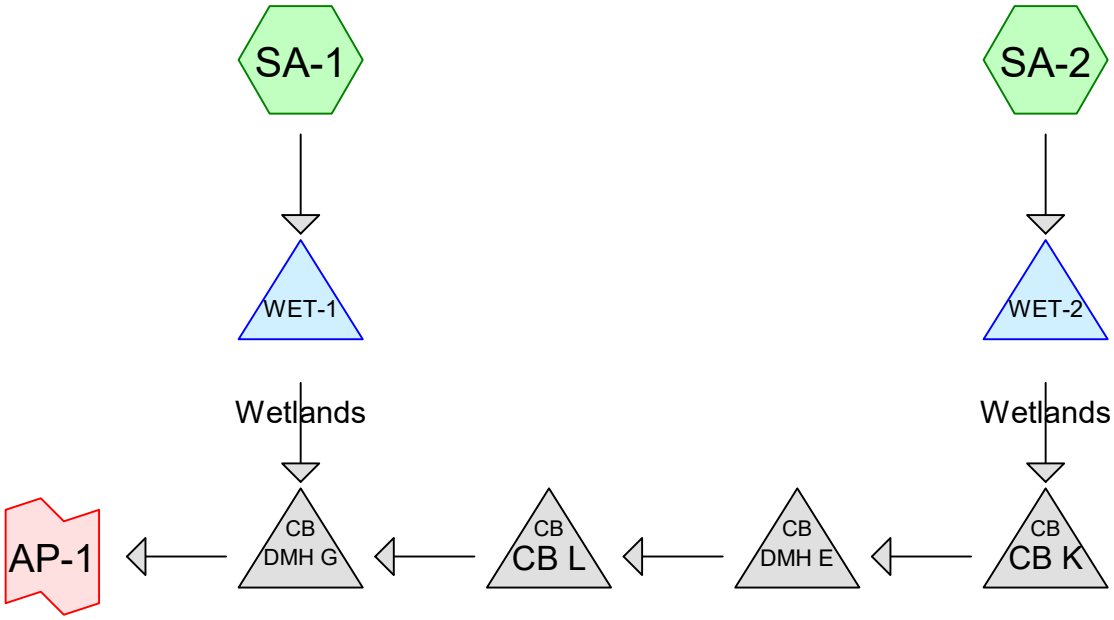
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Appendix B
Pre-Development Calculations



Subcat Reach Pond Link

Routing Diagram for TV3 Pre Development
Prepared by HP Inc., Printed 9/16/2026
HydroCAD® 10.00-22 s/n 01857 © 2018 HydroCAD Software Solutions LLC

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 SA-1: Runoff Area=74,616 sf 6.69% Impervious Runoff Depth>5.23"
Flow Length=435' Tc=33.2 min CN=79 Runoff=6.00 cfs 0.746 af

Subcatchment SA-2: Runoff Area=85,726 sf 25.68% Impervious Runoff Depth>5.67"
Flow Length=443' Tc=43.0 min CN=83 Runoff=6.51 cfs 0.930 af

Pond CB K: Peak Elev=33.62' Inflow=3.70 cfs 0.929 af
18.0" Round Culvert n=0.013 L=66.0' S=0.0026 '/' Outflow=3.70 cfs 0.929 af

Pond CB L: Peak Elev=33.15' Inflow=3.70 cfs 0.929 af
24.0" Round Culvert n=0.012 L=58.0' S=0.0074 '/' Outflow=3.70 cfs 0.929 af

Pond DMH E: Peak Elev=33.30' Inflow=3.70 cfs 0.929 af
24.0" Round Culvert n=0.013 L=33.0' S=-0.0070 '/' Outflow=3.70 cfs 0.929 af

Pond DMH G: Peak Elev=33.72' Inflow=9.00 cfs 1.675 af
24.0" Round Culvert n=0.012 L=80.0' S=0.0004 '/' Outflow=9.00 cfs 1.675 af

Pond WET-1: Wetlands Peak Elev=34.16' Storage=778 cf Inflow=6.00 cfs 0.746 af
18.0" Round Culvert n=0.012 L=43.0' S=0.0195 '/' Outflow=5.72 cfs 0.746 af

Pond WET-2: Wetlands Peak Elev=35.36' Storage=7,293 cf Inflow=6.51 cfs 0.930 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0158 '/' Outflow=3.70 cfs 0.929 af

Link AP-1: Inflow=9.00 cfs 1.675 af
Primary=9.00 cfs 1.675 af

Total Runoff Area = 3.681 ac Runoff Volume = 1.677 af Average Runoff Depth = 5.47"
83.16% Pervious = 3.061 ac 16.84% Impervious = 0.620 ac

Summary for Subcatchment SA-1:

Runoff = 6.00 cfs @ 12.45 hrs, Volume= 0.746 af, Depth> 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

Area (sf)	CN	Description
2,549	80	>75% Grass cover, Good, HSG D
67,078	77	Woods, Good, HSG D
4,989	98	Paved parking, HSG D
74,616	79	Weighted Average
69,627		93.31% Pervious Area
4,989		6.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.6	150	0.0333	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
8.6	285	0.0123	0.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.2	435	Total			

Summary for Subcatchment SA-2:

Runoff = 6.51 cfs @ 12.57 hrs, Volume= 0.930 af, Depth> 5.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

Area (sf)	CN	Description
6,101	80	>75% Grass cover, Good, HSG D
57,608	77	Woods, Good, HSG D
22,017	98	Paved parking, HSG D
85,726	83	Weighted Average
63,709		74.32% Pervious Area
22,017		25.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.9	150	0.0130	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
7.1	293	0.0188	0.69		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
43.0	443	Total			

Summary for Pond CB K:

Inflow Area = 1.968 ac, 25.68% Impervious, Inflow Depth > 5.67" for 100-year event
Inflow = 3.70 cfs @ 13.02 hrs, Volume= 0.929 af
Outflow = 3.70 cfs @ 13.02 hrs, Volume= 0.929 af, Atten= 0%, Lag= 0.0 min
Primary = 3.70 cfs @ 13.02 hrs, Volume= 0.929 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 33.62' @ 13.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.44'	**18.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.44' / 32.27' S= 0.0026 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.70 cfs @ 13.02 hrs HW=33.62' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 3.70 cfs @ 3.42 fps)

Summary for Pond CB L:

Inflow Area = 1.968 ac, 25.68% Impervious, Inflow Depth > 5.67" for 100-year event
Inflow = 3.70 cfs @ 13.02 hrs, Volume= 0.929 af
Outflow = 3.70 cfs @ 13.02 hrs, Volume= 0.929 af, Atten= 0%, Lag= 0.0 min
Primary = 3.70 cfs @ 13.02 hrs, Volume= 0.929 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 33.15' @ 13.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.28'	**24.0" Round Culvert** L= 58.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.28' / 31.85' S= 0.0074 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=3.70 cfs @ 13.02 hrs HW=33.15' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 3.70 cfs @ 4.14 fps)

Summary for Pond DMH E:

Inflow Area = 1.968 ac, 25.68% Impervious, Inflow Depth > 5.67" for 100-year event
Inflow = 3.70 cfs @ 13.02 hrs, Volume= 0.929 af
Outflow = 3.70 cfs @ 13.02 hrs, Volume= 0.929 af, Atten= 0%, Lag= 0.0 min
Primary = 3.70 cfs @ 13.02 hrs, Volume= 0.929 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 33.30' @ 13.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.42'	**24.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 32.19' / 32.42' S= -0.0070 '/' Cc= 0.900
n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=3.70 cfs @ 13.02 hrs HW=33.30' (Free Discharge)
1=Culvert (Barrel Controls 3.70 cfs @ 3.00 fps)

Summary for Pond DMH G:

Inflow Area = 3.681 ac, 16.84% Impervious, Inflow Depth > 5.46" for 100-year event
Inflow = 9.00 cfs @ 12.60 hrs, Volume= 1.675 af
Outflow = 9.00 cfs @ 12.60 hrs, Volume= 1.675 af, Atten= 0%, Lag= 0.0 min
Primary = 9.00 cfs @ 12.60 hrs, Volume= 1.675 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 33.72' @ 12.60 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	31.85'	**24.0" Round Culvert**
			L= 80.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 31.85' / 31.82' S= 0.0004 '/' Cc= 0.900
			n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=9.00 cfs @ 12.60 hrs HW=33.72' (Free Discharge)
1=Culvert (Barrel Controls 9.00 cfs @ 3.83 fps)

Summary for Pond WET-1: Wetlands

Inflow Area = 1.713 ac, 6.69% Impervious, Inflow Depth > 5.23" for 100-year event
Inflow = 6.00 cfs @ 12.45 hrs, Volume= 0.746 af
Outflow = 5.72 cfs @ 12.54 hrs, Volume= 0.746 af, Atten= 5%, Lag= 5.5 min
Primary = 5.72 cfs @ 12.54 hrs, Volume= 0.746 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 34.16' @ 12.54 hrs Surf.Area= 2,444 sf Storage= 778 cf

Plug-Flow detention time= 1.0 min calculated for 0.746 af (100% of inflow)
Center-of-Mass det. time= 1.0 min (795.5 - 794.5)

Volume	Invert	Avail.Storage	Storage Description
#1	33.00'	24,614 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.00	78	0	0
34.00	949	514	514
35.00	10,534	5,742	6,255
36.00	26,183	18,359	24,614

Device	Routing	Invert	Outlet Devices
#1	Primary	32.69'	**18.0" Round Culvert**
			L= 43.0' CPP, projecting, no headwall, Ke= 0.900

Inlet / Outlet Invert= 32.69' / 31.85' S= 0.0195 '/' Cc= 0.900
n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=5.71 cfs @ 12.54 hrs HW=34.15' (Free Discharge)
1=Culvert (Inlet Controls 5.71 cfs @ 3.25 fps)

Summary for Pond WET-2: Wetlands

Inflow Area = 1.968 ac, 25.68% Impervious, Inflow Depth > 5.67" for 100-year event
Inflow = 6.51 cfs @ 12.57 hrs, Volume= 0.930 af
Outflow = 3.70 cfs @ 13.02 hrs, Volume= 0.929 af, Atten= 43%, Lag= 27.0 min
Primary = 3.70 cfs @ 13.02 hrs, Volume= 0.929 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 35.36' @ 13.02 hrs Surf.Area= 10,380 sf Storage= 7,293 cf

Plug-Flow detention time= 15.8 min calculated for 0.929 af (100% of inflow)
Center-of-Mass det. time= 15.2 min (809.4 - 794.2)

Volume	Invert	Avail.Storage	Storage Description
#1	33.33'	16,072 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.33	10	0	0
34.00	1,188	401	401
35.00	6,466	3,827	4,228
36.00	17,222	11,844	16,072

Device	Routing	Invert	Outlet Devices
#1	Primary	33.33'	**12.0" Round Culvert**
			L= 45.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 33.33' / 32.62' S= 0.0158 '/' Cc= 0.900
			n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=3.70 cfs @ 13.02 hrs HW=35.36' (Free Discharge)
1=Culvert (Inlet Controls 3.70 cfs @ 4.71 fps)

Summary for Link AP-1:

Inflow Area = 3.681 ac, 16.84% Impervious, Inflow Depth > 5.46" for 100-year event
Inflow = 9.00 cfs @ 12.60 hrs, Volume= 1.675 af
Primary = 9.00 cfs @ 12.60 hrs, Volume= 1.675 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 SA-1: Runoff Area=74,616 sf 6.69% Impervious Runoff Depth>1.15"
Flow Length=435' Tc=33.2 min CN=79 Runoff=1.34 cfs 0.164 af

Subcatchment SA-2: Runoff Area=85,726 sf 25.68% Impervious Runoff Depth>1.40"
Flow Length=443' Tc=43.0 min CN=83 Runoff=1.66 cfs 0.229 af

Pond CB K: Peak Elev=33.17' Inflow=1.56 cfs 0.229 af
18.0" Round Culvert n=0.013 L=66.0' S=0.0026 '/' Outflow=1.56 cfs 0.229 af

Pond CB L: Peak Elev=32.82' Inflow=1.56 cfs 0.229 af
24.0" Round Culvert n=0.012 L=58.0' S=0.0074 '/' Outflow=1.56 cfs 0.229 af

Pond DMH E: Peak Elev=32.93' Inflow=1.56 cfs 0.229 af
24.0" Round Culvert n=0.013 L=33.0' S=-0.0070 '/' Outflow=1.56 cfs 0.229 af

Pond DMH G: Peak Elev=32.84' Inflow=2.76 cfs 0.393 af
24.0" Round Culvert n=0.012 L=80.0' S=0.0004 '/' Outflow=2.76 cfs 0.393 af

Pond WET-1: Wetlands Peak Elev=33.28' Storage=56 cf Inflow=1.34 cfs 0.164 af
18.0" Round Culvert n=0.012 L=43.0' S=0.0195 '/' Outflow=1.33 cfs 0.164 af

Pond WET-2: Wetlands Peak Elev=34.11' Storage=565 cf Inflow=1.66 cfs 0.229 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0158 '/' Outflow=1.56 cfs 0.229 af

Link AP-1: Inflow=2.76 cfs 0.393 af
Primary=2.76 cfs 0.393 af

Total Runoff Area = 3.681 ac Runoff Volume = 0.393 af Average Runoff Depth = 1.28"
83.16% Pervious = 3.061 ac 16.84% Impervious = 0.620 ac

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 SA-1: Runoff Area=74,616 sf 6.69% Impervious Runoff Depth>2.27"
Flow Length=435' Tc=33.2 min CN=79 Runoff=2.66 cfs 0.324 af

Subcatchment SA-2: Runoff Area=85,726 sf 25.68% Impervious Runoff Depth>2.60"
Flow Length=443' Tc=43.0 min CN=83 Runoff=3.07 cfs 0.427 af

Pond CB K: Peak Elev=33.37' Inflow=2.48 cfs 0.426 af
18.0" Round Culvert n=0.013 L=66.0' S=0.0026 '/' Outflow=2.48 cfs 0.426 af

Pond CB L: Peak Elev=32.98' Inflow=2.48 cfs 0.426 af
24.0" Round Culvert n=0.012 L=58.0' S=0.0074 '/' Outflow=2.48 cfs 0.426 af

Pond DMH E: Peak Elev=33.09' Inflow=2.48 cfs 0.426 af
24.0" Round Culvert n=0.013 L=33.0' S=-0.0070 '/' Outflow=2.48 cfs 0.426 af

Pond DMH G: Peak Elev=33.16' Inflow=4.81 cfs 0.750 af
24.0" Round Culvert n=0.012 L=80.0' S=0.0004 '/' Outflow=4.81 cfs 0.750 af

Pond WET-1: Wetlands Peak Elev=33.56' Storage=178 cf Inflow=2.66 cfs 0.324 af
18.0" Round Culvert n=0.012 L=43.0' S=0.0195 '/' Outflow=2.65 cfs 0.324 af

Pond WET-2: Wetlands Peak Elev=34.52' Storage=1,725 cf Inflow=3.07 cfs 0.427 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0158 '/' Outflow=2.48 cfs 0.426 af

Link AP-1: Inflow=4.81 cfs 0.750 af
Primary=4.81 cfs 0.750 af

Total Runoff Area = 3.681 ac Runoff Volume = 0.751 af Average Runoff Depth = 2.45"
83.16% Pervious = 3.061 ac 16.84% Impervious = 0.620 ac

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 SA-1: Runoff Area=74,616 sf 6.69% Impervious Runoff Depth>3.25"
Flow Length=435' Tc=33.2 min CN=79 Runoff=3.79 cfs 0.464 af

Subcatchment SA-2: Runoff Area=85,726 sf 25.68% Impervious Runoff Depth>3.63"
Flow Length=443' Tc=43.0 min CN=83 Runoff=4.24 cfs 0.595 af

Pond CB K: Peak Elev=33.48' Inflow=3.00 cfs 0.594 af
18.0" Round Culvert n=0.013 L=66.0' S=0.0026 '/' Outflow=3.00 cfs 0.594 af

Pond CB L: Peak Elev=33.05' Inflow=3.00 cfs 0.594 af
24.0" Round Culvert n=0.012 L=58.0' S=0.0074 '/' Outflow=3.00 cfs 0.594 af

Pond DMH E: Peak Elev=33.19' Inflow=3.00 cfs 0.594 af
24.0" Round Culvert n=0.013 L=33.0' S=-0.0070 '/' Outflow=3.00 cfs 0.594 af

Pond DMH G: Peak Elev=33.37' Inflow=6.32 cfs 1.058 af
24.0" Round Culvert n=0.012 L=80.0' S=0.0004 '/' Outflow=6.32 cfs 1.058 af

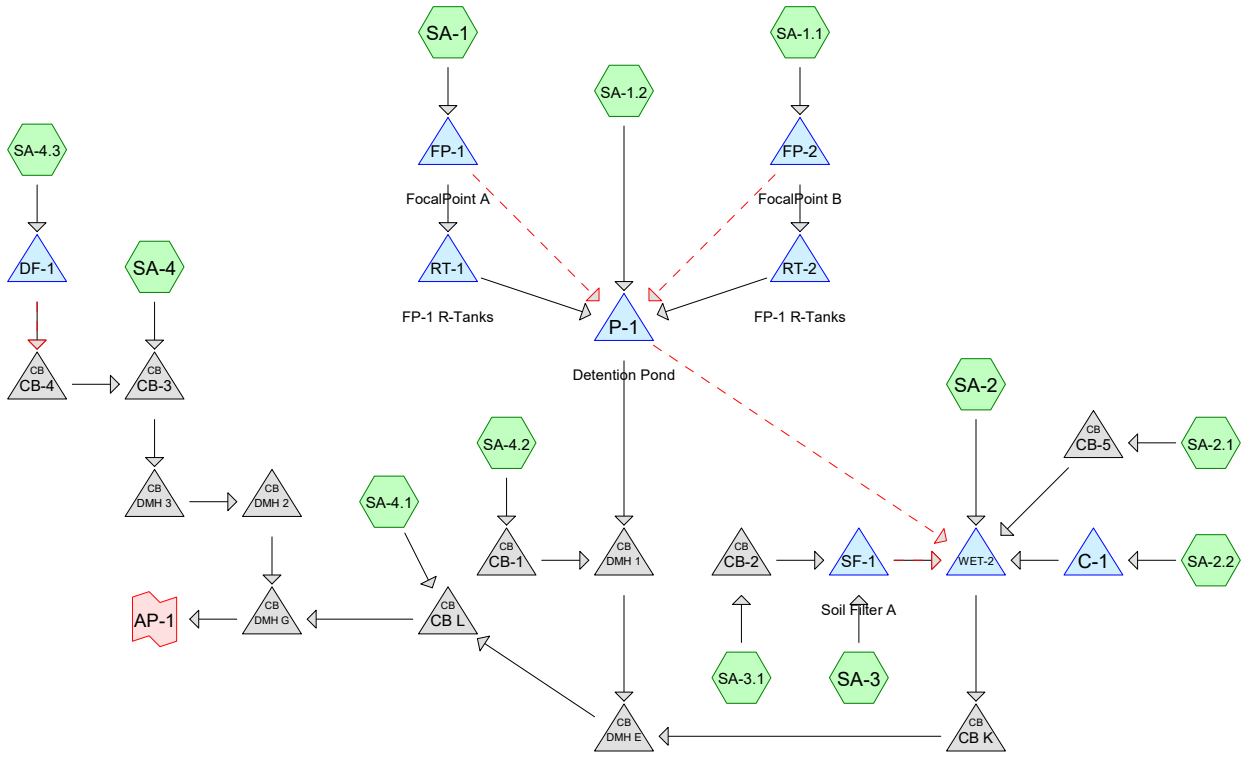
Pond WET-1: Wetlands Peak Elev=33.76' Storage=312 cf Inflow=3.79 cfs 0.464 af
18.0" Round Culvert n=0.012 L=43.0' S=0.0195 '/' Outflow=3.76 cfs 0.464 af

Pond WET-2: Wetlands Peak Elev=34.84' Storage=3,272 cf Inflow=4.24 cfs 0.595 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0158 '/' Outflow=3.00 cfs 0.594 af

Link AP-1: Inflow=6.32 cfs 1.058 af
Primary=6.32 cfs 1.058 af

Total Runoff Area = 3.681 ac Runoff Volume = 1.059 af Average Runoff Depth = 3.45"
83.16% Pervious = 3.061 ac 16.84% Impervious = 0.620 ac

Appendix C
Post Development Calculations



Subcat Reach Pond Link

Routing Diagram for TV3 Post Development(100-YR Mods)

Prepared by HP Inc., Printed 9/16/2026

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 SA-1: Runoff Area=30,654 sf 85.24% Impervious Runoff Depth>7.01"
Flow Length=216' Tc=6.0 min CN=95 Runoff=5.40 cfs 0.411 af

Subcatchment SA-1.1: Runoff Area=32,563 sf 52.65% Impervious Runoff Depth>6.37"
Flow Length=283' Tc=37.2 min CN=89 Runoff=2.89 cfs 0.397 af

Subcatchment SA-1.2: Runoff Area=22,052 sf 10.04% Impervious Runoff Depth>5.47"
Flow Length=200' Tc=27.5 min CN=81 Runoff=2.00 cfs 0.231 af

Subcatchment SA-2: Runoff Area=29,790 sf 11.83% Impervious Runoff Depth>5.38"
Flow Length=197' Tc=12.4 min CN=80 Runoff=3.65 cfs 0.306 af

Subcatchment SA-2.1: Runoff Area=3,534 sf 94.51% Impervious Runoff Depth>7.17"
Flow Length=95' Slope=0.0030 '/' Tc=6.0 min CN=97 Runoff=0.63 cfs 0.048 af

Subcatchment SA-2.2: Runoff Area=11,458 sf 72.29% Impervious Runoff Depth>6.83"
Flow Length=200' Tc=6.0 min CN=93 Runoff=1.99 cfs 0.150 af

Subcatchment SA-3: Runoff Area=2,698 sf 5.67% Impervious Runoff Depth>5.50"
Flow Length=75' Slope=0.0400 '/' Tc=6.0 min CN=81 Runoff=0.41 cfs 0.028 af

Subcatchment SA-3.1: Runoff Area=3,570 sf 100.00% Impervious Runoff Depth>7.24"
Tc=0.0 min CN=98 Runoff=0.75 cfs 0.049 af

Subcatchment SA-4: Runoff Area=4,788 sf 22.37% Impervious Runoff Depth>5.85"
Flow Length=82' Slope=0.0240 '/' Tc=7.9 min CN=84 Runoff=0.72 cfs 0.054 af

Subcatchment SA-4.1: Runoff Area=11,086 sf 81.24% Impervious Runoff Depth>7.01"
Tc=6.0 min CN=95 Runoff=1.95 cfs 0.149 af

Subcatchment SA-4.2: Runoff Area=3,131 sf 71.96% Impervious Runoff Depth>6.83"
Tc=0.0 min CN=93 Runoff=0.64 cfs 0.041 af

Subcatchment SA-4.3: Runoff Area=5,018 sf 83.12% Impervious Runoff Depth>7.01"
Flow Length=30' Slope=0.1000 '/' Tc=6.0 min CN=95 Runoff=0.88 cfs 0.067 af

Pond C-1: Peak Elev=37.30' Storage=66 cf Inflow=1.99 cfs 0.150 af
15.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=1.99 cfs 0.150 af

Pond CB K: Peak Elev=33.61' Inflow=3.63 cfs 0.874 af
18.0" Round Culvert n=0.013 L=66.0' S=0.0026 '/' Outflow=3.63 cfs 0.874 af

Pond CB L: Peak Elev=33.70' Inflow=8.41 cfs 1.562 af
24.0" Round Culvert n=0.012 L=58.0' S=0.0074 '/' Outflow=8.41 cfs 1.562 af

Pond CB-1: Peak Elev=33.17' Inflow=0.64 cfs 0.041 af
12.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.64 cfs 0.041 af

Pond CB-2: Peak Elev=37.09' Inflow=0.75 cfs 0.049 af
15.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=0.75 cfs 0.049 af

Pond CB-3: Peak Elev=33.81' Inflow=0.91 cfs 0.107 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0074 '/' Outflow=0.91 cfs 0.107 af

Pond CB-4: Peak Elev=34.27' Inflow=0.44 cfs 0.054 af
15.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=0.44 cfs 0.054 af

Pond CB-5: Peak Elev=36.89' Inflow=0.63 cfs 0.048 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=0.63 cfs 0.048 af

Pond DF-1: Peak Elev=38.82' Storage=1,143 cf Inflow=0.88 cfs 0.067 af
Primary=0.05 cfs 0.042 af Secondary=0.39 cfs 0.012 af Outflow=0.44 cfs 0.054 af

Pond DMH 1: Peak Elev=33.93' Inflow=4.30 cfs 0.539 af
15.0" Round Culvert n=0.013 L=35.0' S=0.0049 '/' Outflow=4.30 cfs 0.539 af

Pond DMH 2: Peak Elev=32.54' Inflow=0.91 cfs 0.107 af
18.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.91 cfs 0.107 af

Pond DMH 3: Peak Elev=33.39' Inflow=0.91 cfs 0.107 af
15.0" Round Culvert n=0.013 L=76.0' S=0.0100 '/' Outflow=0.91 cfs 0.107 af

Pond DMH E: Peak Elev=33.86' Inflow=7.89 cfs 1.413 af
24.0" Round Culvert n=0.013 L=33.0' S=-0.0070 '/' Outflow=7.89 cfs 1.413 af

Pond DMH G: Peak Elev=33.71' Inflow=8.95 cfs 1.669 af
24.0" Round Culvert n=0.012 L=80.0' S=0.0004 '/' Outflow=8.95 cfs 1.669 af

Pond FP-1: FocalPoint A Peak Elev=38.52' Storage=1,247 cf Inflow=5.40 cfs 0.411 af
Primary=0.28 cfs 0.234 af Secondary=5.20 cfs 0.180 af Outflow=5.48 cfs 0.414 af

Pond FP-2: FocalPoint B Peak Elev=38.09' Storage=843 cf Inflow=2.89 cfs 0.397 af
Primary=0.23 cfs 0.196 af Secondary=2.50 cfs 0.193 af Outflow=2.73 cfs 0.390 af

Pond P-1: Detention Pond Peak Elev=36.57' Storage=12,819 cf Inflow=7.51 cfs 1.032 af
Primary=4.20 cfs 0.498 af Secondary=1.99 cfs 0.326 af Outflow=6.19 cfs 0.824 af

Pond RT-1: FP-1 R-Tanks Peak Elev=34.06' Storage=88 cf Inflow=0.28 cfs 0.234 af
Outflow=0.28 cfs 0.233 af

Pond RT-2: FP-1 R-Tanks Peak Elev=34.27' Storage=73 cf Inflow=0.23 cfs 0.196 af
Outflow=0.23 cfs 0.195 af

Pond SF-1: Soil Filter A Peak Elev=37.58' Storage=1,565 cf Inflow=1.01 cfs 0.078 af
Primary=0.01 cfs 0.015 af Secondary=0.53 cfs 0.030 af Outflow=0.54 cfs 0.044 af

Pond WET-2: Peak Elev=35.31' Storage=5,373 cf Inflow=7.07 cfs 0.875 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0158 '/' Outflow=3.63 cfs 0.874 af

Link AP-1: Inflow=8.95 cfs 1.669 af
Primary=8.95 cfs 1.669 af

Total Runoff Area = 3.681 ac Runoff Volume = 1.931 af Average Runoff Depth = 6.30"
49.57% Pervious = 1.825 ac 50.43% Impervious = 1.856 ac

Summary for Subcatchment SA-1:

Runoff = 5.40 cfs @ 12.09 hrs, Volume= 0.411 af, Depth> 7.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	26,128	98	Proposed Impervious
*	4,526	80	Proposed Grass (D)
	30,654	95	Weighted Average
	4,526		14.76% Pervious Area
	26,128		85.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	150	0.0060	0.91		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.10"
0.5	66	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.3	216	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-1.1:

Runoff = 2.89 cfs @ 12.49 hrs, Volume= 0.397 af, Depth> 6.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	10,043	98	Proposed Impervious
*	8,005	80	Proposed Grass
*	7,101	98	Existing Impervious
	4,536	77	Woods, Good, HSG D
	2,878	80	>75% Grass cover, Good, HSG D
	32,563	89	Weighted Average
	15,419		47.35% Pervious Area
	17,144		52.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.9	150	0.0130	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
1.3	133	0.0070	1.66	2.22	**Parabolic Channel,** W=4.00' D=0.50' Area=1.3 sf Perim=4.2' n= 0.035 Earth, dense weeds
37.2	283	Total			

Summary for Subcatchment SA-1.2:

Runoff = 2.00 cfs @ 12.37 hrs, Volume= 0.231 af, Depth> 5.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	8,934	80	Proposed Grass(D)
*	2,214	98	Existing Impervious
	8,634	77	Woods, Good, HSG D
	2,270	80	>75% Grass cover, Good, HSG D
	22,052	81	Weighted Average
	19,838		89.96% Pervious Area
	2,214		10.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.2	150	0.0260	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.3	50	0.0200	2.81	3.75	**Parabolic Channel,** W=4.00' D=0.50' Area=1.3 sf Perim=4.2' n= 0.035 Earth, dense weeds
27.5	200	Total			

Summary for Subcatchment SA-2:

Runoff = 3.65 cfs @ 12.17 hrs, Volume= 0.306 af, Depth> 5.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	889	98	Proposed Impervious
*	2,634	98	Existing Impervious
*	4,500	80	Proposed Grass (D)
	1,012	80	>75% Grass cover, Good, HSG D
	20,755	77	Woods, Good, HSG D
	29,790	80	Weighted Average
	26,267		88.17% Pervious Area
	3,523		11.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	150	0.0330	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"
1.1	47	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.4	197	Total			

Summary for Subcatchment SA-2.1:

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af, Depth> 7.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	3,340	98	Existing Impervious
	194	80	>75% Grass cover, Good, HSG D
	3,534	97	Weighted Average
	194		5.49% Pervious Area
	3,340		94.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	95	0.0030	0.63		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.10"
2.5	95	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-2.2:

Runoff = 1.99 cfs @ 12.09 hrs, Volume= 0.150 af, Depth> 6.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	8,283	98	Existing Impervious
*	1,230	80	Proposed Grass(D)
	1,945	80	>75% Grass cover, Good, HSG D
	11,458	93	Weighted Average
	3,175		27.71% Pervious Area
	8,283		72.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	150	0.0120	1.20		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.10"
0.2	50	0.0740	5.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.3	200	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment SA-3:

Runoff = 0.41 cfs @ 12.09 hrs, Volume= 0.028 af, Depth> 5.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	153	98	Proposed Impervious
*	2,545	80	Proposed Grass (D)
	2,698	81	Weighted Average
	2,545		94.33% Pervious Area
	153		5.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	75	0.0400	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"

Summary for Subcatchment SA-3.1:

Runoff = 0.75 cfs @ 12.00 hrs, Volume= 0.049 af, Depth> 7.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	3,570	98	Proposed Impervious
	3,570		100.00% Impervious Area

Summary for Subcatchment SA-4:

Runoff = 0.72 cfs @ 12.11 hrs, Volume= 0.054 af, Depth> 5.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	1,071	98	Proposed Impervious
*	3,717	80	Proposed Grass(D)
	4,788	84	Weighted Average
	3,717		77.63% Pervious Area
	1,071		22.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	82	0.0240	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.10"

Summary for Subcatchment SA-4.1:

Runoff = 1.95 cfs @ 12.09 hrs, Volume= 0.149 af, Depth> 7.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	5,583	98	Proposed Impervious
*	3,423	98	Existing Impervious
*	1,841	80	Proposed Grass (D)
	239	80	>75% Grass cover, Good, HSG D
	11,086	95	Weighted Average
	2,080		18.76% Pervious Area
	9,006		81.24% Impervious Area

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

Summary for Subcatchment SA-4.2:

Runoff = 0.64 cfs @ 12.00 hrs, Volume= 0.041 af, Depth> 6.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	2,253	98	Proposed Impervious
*	878	80	Proposed Grass(D)
	3,131	93	Weighted Average
	878		28.04% Pervious Area
	2,253		71.96% Impervious Area

Summary for Subcatchment SA-4.3:

Runoff = 0.88 cfs @ 12.09 hrs, Volume= 0.067 af, Depth> 7.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.10"

	Area (sf)	CN	Description
*	4,171	98	Proposed Impervious
*	847	80	Proposed Grass(D)
	5,018	95	Weighted Average
	847		16.88% Pervious Area
	4,171		83.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	30	0.1000	2.03		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.10"
0.2	30	Total, Increased to minimum Tc = 6.0 min			

Summary for Pond C-1:

Inflow Area = 0.263 ac, 72.29% Impervious, Inflow Depth > 6.83" for 100-year event
Inflow = 1.99 cfs @ 12.09 hrs, Volume= 0.150 af
Outflow = 1.99 cfs @ 12.10 hrs, Volume= 0.150 af, Atten= 0%, Lag= 0.6 min
Primary = 1.99 cfs @ 12.10 hrs, Volume= 0.150 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 37.30' @ 12.10 hrs Surf.Area= 148 sf Storage= 66 cf

Plug-Flow detention time= 0.6 min calculated for 0.149 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (743.5 - 743.1)

Volume	Invert	Avail.Storage	Storage Description
#1	36.50'	530 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
36.50	1	0	0
37.00	109	28	28
38.00	239	174	202
39.00	417	328	530

Device	Routing	Invert	Outlet Devices
#1	Primary	36.50'	**15.0" Round Culvert** L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 36.50' / 36.18' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.97 cfs @ 12.10 hrs HW=37.30' (Free Discharge)
1=Culvert (Inlet Controls 1.97 cfs @ 2.40 fps)

Summary for Pond CB K:

Inflow Area = 1.172 ac, 36.96% Impervious, Inflow Depth > 8.95" for 100-year event
Inflow = 3.63 cfs @ 12.57 hrs, Volume= 0.874 af
Outflow = 3.63 cfs @ 12.57 hrs, Volume= 0.874 af, Atten= 0%, Lag= 0.0 min
Primary = 3.63 cfs @ 12.57 hrs, Volume= 0.874 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 33.61' @ 12.57 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.44'	**18.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.44' / 32.27' S= 0.0026 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.63 cfs @ 12.57 hrs HW=33.61' (Free Discharge)
1=Culvert (Barrel Controls 3.63 cfs @ 3.40 fps)

Summary for Pond CB L:

Inflow Area = 3.456 ac, 50.23% Impervious, Inflow Depth > 5.42" for 100-year event
Inflow = 8.41 cfs @ 12.43 hrs, Volume= 1.562 af
Outflow = 8.41 cfs @ 12.43 hrs, Volume= 1.562 af, Atten= 0%, Lag= 0.0 min
Primary = 8.41 cfs @ 12.43 hrs, Volume= 1.562 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 33.70' @ 12.43 hrs
Flood Elev= 36.69'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.28'	**24.0" Round Culvert** L= 58.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.28' / 31.85' S= 0.0074 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=8.39 cfs @ 12.43 hrs HW=33.70' (Free Discharge)
1=Culvert (Barrel Controls 8.39 cfs @ 4.93 fps)

Summary for Pond CB-1:

Inflow Area = 0.072 ac, 71.96% Impervious, Inflow Depth > 6.83" for 100-year event
Inflow = 0.64 cfs @ 12.00 hrs, Volume= 0.041 af
Outflow = 0.64 cfs @ 12.00 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min
Primary = 0.64 cfs @ 12.00 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 33.17' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.70'	**12.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.70' / 32.64' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.00 hrs HW=33.17' (Free Discharge)
1=Culvert (Barrel Controls 0.64 cfs @ 2.55 fps)

Summary for Pond CB-2:

Inflow Area = 0.082 ac,100.00% Impervious, Inflow Depth > 7.24" for 100-year event
Inflow = 0.75 cfs @ 12.00 hrs, Volume= 0.049 af
Outflow = 0.75 cfs @ 12.00 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min
Primary = 0.75 cfs @ 12.00 hrs, Volume= 0.049 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 37.09' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	36.60'	**15.0" Round Culvert**

L= 20.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 36.60' / 36.50' S= 0.0050 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.75 cfs @ 12.00 hrs HW=37.09' (Free Discharge)
1=Culvert (Barrel Controls 0.75 cfs @ 2.49 fps)

Summary for Pond CB-3:

Inflow Area = 0.225 ac, 53.46% Impervious, Inflow Depth > 5.73" for 100-year event
Inflow = 0.91 cfs @ 12.21 hrs, Volume= 0.107 af
Outflow = 0.91 cfs @ 12.21 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min
Primary = 0.91 cfs @ 12.21 hrs, Volume= 0.107 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 33.81' @ 12.21 hrs
Flood Elev= 38.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.32'	**15.0" Round Culvert** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.32' / 33.04' S= 0.0074 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.89 cfs @ 12.21 hrs HW=33.80' (Free Discharge)
1=Culvert (Barrel Controls 0.89 cfs @ 3.03 fps)

Summary for Pond CB-4:

Inflow Area = 0.115 ac, 83.12% Impervious, Inflow Depth > 5.61" for 100-year event
Inflow = 0.44 cfs @ 12.25 hrs, Volume= 0.054 af
Outflow = 0.44 cfs @ 12.25 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 0.44 cfs @ 12.25 hrs, Volume= 0.054 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 34.27' @ 12.25 hrs
Flood Elev= 39.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.92'	**15.0" Round Culvert** L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.92' / 33.52' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=0.44 cfs @ 12.25 hrs HW=34.27' (Free Discharge)
1=Culvert (Barrel Controls 0.44 cfs @ 2.29 fps)

Summary for Pond CB-5:

Inflow Area = 0.081 ac, 94.51% Impervious, Inflow Depth > 7.17" for 100-year event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 36.89' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	36.50'	**15.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.50' / 36.25' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.61 cfs @ 12.09 hrs HW=36.89' (Free Discharge)
1=Culvert (Barrel Controls 0.61 cfs @ 2.83 fps)

Summary for Pond DF-1:

Inflow Area = 0.115 ac, 83.12% Impervious, Inflow Depth > 7.01" for 100-year event
Inflow = 0.88 cfs @ 12.09 hrs, Volume= 0.067 af
Outflow = 0.44 cfs @ 12.25 hrs, Volume= 0.054 af, Atten= 50%, Lag= 9.9 min
Primary = 0.05 cfs @ 12.25 hrs, Volume= 0.042 af
Secondary = 0.39 cfs @ 12.25 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 38.82' @ 12.25 hrs Surf.Area= 2,261 sf Storage= 1,143 cf

Plug-Flow detention time= 144.3 min calculated for 0.054 af (80% of inflow)
Center-of-Mass det. time= 90.7 min (829.4 - 738.7)

Volume	Invert	Avail.Storage	Storage Description
#1	33.92'	284 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 1,418 cf Overall x 20.0% Voids
#2	35.92'	803 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 2,006 cf Overall x 40.0% Voids
#3	38.75'	301 cf	**96.0"W x 6.0"H x 113.00'L Parabolic Arch**
		1,388 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.92	709	0	0
34.92	709	709	709
35.92	709	709	1,418

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.92	709	0	0
36.92	709	709	709
37.92	709	709	1,418
38.75	709	588	2,006

Device	Routing	Invert	Outlet Devices
#1	Primary	33.52'	**0.9" Vert. Orifice/Grate** C= 0.620
#2	Secondary	38.75'	**8.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.05 cfs @ 12.25 hrs HW=38.82' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.05 cfs @ 11.41 fps)

Secondary OutFlow Max=0.37 cfs @ 12.25 hrs HW=38.82' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.37 cfs @ 0.71 fps)

Summary for Pond DMH 1:

Inflow Area = 2.029 ac, 54.00% Impervious, Inflow Depth > 3.19" for 100-year event
Inflow = 4.30 cfs @ 12.44 hrs, Volume= 0.539 af
Outflow = 4.30 cfs @ 12.44 hrs, Volume= 0.539 af, Atten= 0%, Lag= 0.0 min
Primary = 4.30 cfs @ 12.44 hrs, Volume= 0.539 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 33.93' @ 12.44 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.55'	**15.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.55' / 32.38' S= 0.0049 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.29 cfs @ 12.44 hrs HW=33.93' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 4.29 cfs @ 3.95 fps)

Summary for Pond DMH 2:

Inflow Area = 0.225 ac, 53.46% Impervious, Inflow Depth > 5.73" for 100-year event
Inflow = 0.91 cfs @ 12.21 hrs, Volume= 0.107 af
Outflow = 0.91 cfs @ 12.21 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min
Primary = 0.91 cfs @ 12.21 hrs, Volume= 0.107 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 32.54' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.08'	**18.0" Round Culvert** L= 23.0' CPP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 32.08' / 31.85' S= 0.0100 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.89 cfs @ 12.21 hrs HW=32.53' (Free Discharge)
1=Culvert (Barrel Controls 0.89 cfs @ 2.99 fps)

Summary for Pond DMH 3:

Inflow Area = 0.225 ac, 53.46% Impervious, Inflow Depth > 5.73" for 100-year event
Inflow = 0.91 cfs @ 12.21 hrs, Volume= 0.107 af
Outflow = 0.91 cfs @ 12.21 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min
Primary = 0.91 cfs @ 12.21 hrs, Volume= 0.107 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 33.39' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	32.94'	**15.0" Round Culvert**
			L= 76.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 32.94' / 32.18' S= 0.0100 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.89 cfs @ 12.21 hrs HW=33.38' (Free Discharge)
1=Culvert (Inlet Controls 0.89 cfs @ 2.27 fps)

Summary for Pond DMH E:

Inflow Area = 3.201 ac, 47.76% Impervious, Inflow Depth > 5.30" for 100-year event
Inflow = 7.89 cfs @ 12.46 hrs, Volume= 1.413 af
Outflow = 7.89 cfs @ 12.46 hrs, Volume= 1.413 af, Atten= 0%, Lag= 0.0 min
Primary = 7.89 cfs @ 12.46 hrs, Volume= 1.413 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 33.86' @ 12.46 hrs
Flood Elev= 36.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.42'	**24.0" Round Culvert**
			L= 33.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 32.19' / 32.42' S= -0.0070 '/' Cc= 0.900
			n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=7.88 cfs @ 12.46 hrs HW=33.86' (Free Discharge)
1=Culvert (Barrel Controls 7.88 cfs @ 3.81 fps)

Summary for Pond DMH G:

Inflow Area = 3.681 ac, 50.43% Impervious, Inflow Depth > 5.44" for 100-year event
Inflow = 8.95 cfs @ 12.40 hrs, Volume= 1.669 af
Outflow = 8.95 cfs @ 12.40 hrs, Volume= 1.669 af, Atten= 0%, Lag= 0.0 min
Primary = 8.95 cfs @ 12.40 hrs, Volume= 1.669 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 33.71' @ 12.40 hrs
Flood Elev= 37.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	31.85'	**24.0" Round Culvert** L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 31.85' / 31.82' S= 0.0004 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=8.95 cfs @ 12.40 hrs HW=33.71' (Free Discharge)
1=Culvert (Barrel Controls 8.95 cfs @ 3.82 fps)

Summary for Pond FP-1: FocalPoint A

Inflow Area = 0.704 ac, 85.24% Impervious, Inflow Depth > 7.01" for 100-year event
Inflow = 5.40 cfs @ 12.09 hrs, Volume= 0.411 af
Outflow = 5.48 cfs @ 12.09 hrs, Volume= 0.414 af, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 10.25 hrs, Volume= 0.234 af
Secondary = 5.20 cfs @ 12.09 hrs, Volume= 0.180 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 38.52' @ 12.09 hrs Surf.Area= 120 sf Storage= 1,247 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 15.3 min (754.1 - 738.7)

Volume	Invert	Avail.Storage	Storage Description
#1	34.50'	54 cf	**8.00'W x 15.00'L x 2.25'H FocalPoint** 270 cf Overall x 20.0% Voids
#2	36.75'	1,193 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) -Impervious
		1,247 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
36.75	120	0	0
37.00	833	119	119
38.00	1,314	1,074	1,193

Device	Routing	Invert	Outlet Devices
#1	Primary	34.50'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Secondary	37.75'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.28 cfs @ 10.25 hrs HW=34.62' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Secondary OutFlow Max=5.06 cfs @ 12.09 hrs HW=38.48' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 5.06 cfs @ 4.12 fps)

Summary for Pond FP-2: FocalPoint B

Inflow Area = 0.748 ac, 52.65% Impervious, Inflow Depth > 6.37" for 100-year event
Inflow = 2.89 cfs @ 12.49 hrs, Volume= 0.397 af
Outflow = 2.73 cfs @ 12.49 hrs, Volume= 0.390 af, Atten= 5%, Lag= 0.0 min
Primary = 0.23 cfs @ 10.60 hrs, Volume= 0.196 af
Secondary = 2.50 cfs @ 12.49 hrs, Volume= 0.193 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 38.09' @ 12.49 hrs Surf.Area= 100 sf Storage= 843 cf

Plug-Flow detention time= 20.3 min calculated for 0.390 af (98% of inflow)
Center-of-Mass det. time= 13.2 min (789.4 - 776.2)

Volume	Invert	Avail.Storage	Storage Description
#1	34.75'	45 cf	**10.00'W x 10.00'L x 2.25'H FocalPoint** 225 cf Overall x 20.0% Voids
#2	37.00'	798 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) -Impervious
		843 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.00	374	0	0
38.00	1,221	798	798

Device	Routing	Invert	Outlet Devices
#1	Primary	34.75'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Secondary	37.75'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.23 cfs @ 10.60 hrs HW=34.89' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.23 cfs)

Secondary OutFlow Max=2.49 cfs @ 12.49 hrs HW=38.09' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 2.49 cfs @ 1.89 fps)

Summary for Pond P-1: Detention Pond

Inflow Area = 1.958 ac, 53.34% Impervious, Inflow Depth > 6.33" for 100-year event
Inflow = 7.51 cfs @ 12.10 hrs, Volume= 1.032 af
Outflow = 6.19 cfs @ 12.45 hrs, Volume= 0.824 af, Atten= 18%, Lag= 21.1 min
Primary = 4.20 cfs @ 12.45 hrs, Volume= 0.498 af
Secondary = 1.99 cfs @ 12.45 hrs, Volume= 0.326 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 36.57' @ 12.45 hrs Surf.Area= 5,699 sf Storage= 12,819 cf
Flood Elev= 38.50' Surf.Area= 6,183 sf Storage= 15,393 cf

Plug-Flow detention time= 108.9 min calculated for 0.824 af (80% of inflow)
Center-of-Mass det. time= 53.1 min (829.3 - 776.2)

Volume	Invert	Avail.Storage	Storage Description
#1	33.60'	15,393 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.60	2,770	0	0
34.00	3,480	1,250	1,250
35.00	4,245	3,863	5,112
36.00	5,067	4,656	9,768
37.00	6,183	5,625	15,393

Device	Routing	Invert	Outlet Devices
#1	Primary	33.60'	**15.0" Round Culvert** L= 217.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.60' / 32.54' S= 0.0049 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	33.60'	**2.7" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	36.60'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	36.20'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Secondary	35.82'	**15.0" Round Culvert** L= 110.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 35.82' / 35.00' S= 0.0075 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.19 cfs @ 12.45 hrs HW=36.57' (Free Discharge)
└**1=Culvert** (Passes 4.19 cfs of 6.41 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.33 cfs @ 8.29 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Broad-Crested Rectangular Weir** (Weir Controls 3.86 cfs @ 1.76 fps)

Secondary OutFlow Max=1.98 cfs @ 12.45 hrs HW=36.57' (Free Discharge)
└**5=Culvert** (Inlet Controls 1.98 cfs @ 2.60 fps)

Summary for Pond RT-1: FP-1 R-Tanks

Inflow Area = 0.704 ac, 85.24% Impervious, Inflow Depth > 4.00" for 100-year event
Inflow = 0.28 cfs @ 10.25 hrs, Volume= 0.234 af
Outflow = 0.28 cfs @ 11.40 hrs, Volume= 0.233 af, Atten= 0%, Lag= 69.0 min
Primary = 0.28 cfs @ 11.40 hrs, Volume= 0.233 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 6

Peak Elev= 34.06' @ 11.35 hrs Surf.Area= 265 sf Storage= 88 cf

Plug-Flow detention time= 6.9 min calculated for 0.233 af (99% of inflow)
Center-of-Mass det. time= 4.3 min (773.4 - 769.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	33.47'	66 cf	**10.56'W x 25.11'L x 1.04'H Field A** 275 cf Overall - 109 cf Embedded = 166 cf x 40.0% Voids
#2A	33.72'	104 cf	**ACF R-Tank SD 1** x 45 Inside #1 Inside= 15.7"W x 9.4"H => 0.98 sf x 2.35'L = 2.3 cf Outside= 15.7"W x 9.4"H => 1.03 sf x 2.35'L = 2.4 cf 5 Rows of 9 Chambers
		170 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	33.72'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.28 cfs @ 11.40 hrs HW=34.06' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.28 cfs @ 1.98 fps)

Summary for Pond RT-2: FP-1 R-Tanks

Inflow Area = 0.748 ac, 52.65% Impervious, Inflow Depth > 3.15" for 100-year event
Inflow = 0.23 cfs @ 10.60 hrs, Volume= 0.196 af
Outflow = 0.23 cfs @ 11.65 hrs, Volume= 0.195 af, Atten= 0%, Lag= 63.0 min
Primary = 0.23 cfs @ 11.65 hrs, Volume= 0.195 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 6
Peak Elev= 34.27' @ 11.60 hrs Surf.Area= 240 sf Storage= 73 cf

Plug-Flow detention time= 6.6 min calculated for 0.195 af (99% of inflow)
Center-of-Mass det. time= 4.2 min (816.0 - 811.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	33.72'	61 cf	**10.56'W x 22.77'L x 1.04'H Field A** 249 cf Overall - 97 cf Embedded = 152 cf x 40.0% Voids
#2A	33.97'	92 cf	**ACF R-Tank SD 1** x 40 Inside #1 Inside= 15.7"W x 9.4"H => 0.98 sf x 2.35'L = 2.3 cf Outside= 15.7"W x 9.4"H => 1.03 sf x 2.35'L = 2.4 cf 5 Rows of 8 Chambers
		153 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	33.97'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.23 cfs @ 11.65 hrs HW=34.27' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.23 cfs @ 1.87 fps)

Summary for Pond SF-1: Soil Filter A

Inflow Area = 0.144 ac, 59.40% Impervious, Inflow Depth > 6.49" for 100-year event
Inflow = 1.01 cfs @ 12.01 hrs, Volume= 0.078 af
Outflow = 0.54 cfs @ 12.20 hrs, Volume= 0.044 af, Atten= 47%, Lag= 11.0 min
Primary = 0.01 cfs @ 12.20 hrs, Volume= 0.015 af
Secondary = 0.53 cfs @ 12.20 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 37.58' @ 12.20 hrs Surf.Area= 1,318 sf Storage= 1,565 cf
Flood Elev= 38.00' Surf.Area= 1,505 sf Storage= 2,164 cf

Plug-Flow detention time= 140.2 min calculated for 0.044 af (57% of inflow)
Center-of-Mass det. time= 56.3 min (799.6 - 743.3)

Volume	Invert	Avail.Storage	Storage Description
#1	36.00'	2,164 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
36.00	696	0	0
37.00	1,063	880	880
38.00	1,505	1,284	2,164

Device	Routing	Invert	Outlet Devices
#1	Primary	33.50'	**6.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.50' / 33.38' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Device 1	33.50'	**0.5" Vert. Orifice/Grate** C= 0.600
#3	Secondary	37.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.01 cfs @ 12.20 hrs HW=37.58' (Free Discharge)
└**1=Culvert** (Passes 0.01 cfs of 1.70 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 9.70 fps)

Secondary OutFlow Max=0.52 cfs @ 12.20 hrs HW=37.58' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 0.52 cfs @ 0.69 fps)

Summary for Pond WET-2:

Inflow Area = 1.172 ac, 36.96% Impervious, Inflow Depth > 8.96" for 100-year event
Inflow = 7.07 cfs @ 12.17 hrs, Volume= 0.875 af
Outflow = 3.63 cfs @ 12.57 hrs, Volume= 0.874 af, Atten= 49%, Lag= 23.9 min
Primary = 3.63 cfs @ 12.57 hrs, Volume= 0.874 af

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

Peak Elev= 35.31' @ 12.57 hrs Surf.Area= 6,993 sf Storage= 5,373 cf

Plug-Flow detention time= 11.4 min calculated for 0.874 af (100% of inflow)
Center-of-Mass det. time= 11.1 min (807.1 - 796.1)

Volume	Invert	Avail.Storage	Storage Description
#1	33.33'	11,581 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.33	10	0	0
34.00	1,070	362	362
35.00	5,168	3,119	3,481
36.00	11,033	8,101	11,581

Device	Routing	Invert	Outlet Devices
#1	Primary	33.33'	**12.0" Round Culvert** L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.33' / 32.62' S= 0.0158 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=3.63 cfs @ 12.57 hrs HW=35.31' (Free Discharge)
1=Culvert (Inlet Controls 3.63 cfs @ 4.62 fps)

Summary for Link AP-1:

Inflow Area = 3.681 ac, 50.43% Impervious, Inflow Depth > 5.44" for 100-year event
Inflow = 8.95 cfs @ 12.40 hrs, Volume= 1.669 af
Primary = 8.95 cfs @ 12.40 hrs, Volume= 1.669 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 SA-1: Runoff Area=30,654 sf 85.24% Impervious Runoff Depth>2.41"
Flow Length=216' Tc=6.0 min CN=95 Runoff=1.95 cfs 0.141 af

Subcatchment SA-1.1: Runoff Area=32,563 sf 52.65% Impervious Runoff Depth>1.85"
Flow Length=283' Tc=37.2 min CN=89 Runoff=0.89 cfs 0.115 af

Subcatchment SA-1.2: Runoff Area=22,052 sf 10.04% Impervious Runoff Depth>1.28"
Flow Length=200' Tc=27.5 min CN=81 Runoff=0.48 cfs 0.054 af

Subcatchment SA-2: Runoff Area=29,790 sf 11.83% Impervious Runoff Depth>1.22"
Flow Length=197' Tc=12.4 min CN=80 Runoff=0.84 cfs 0.070 af

Subcatchment SA-2.1: Runoff Area=3,534 sf 94.51% Impervious Runoff Depth>2.59"
Flow Length=95' Slope=0.0030 '/' Tc=6.0 min CN=97 Runoff=0.23 cfs 0.018 af

Subcatchment SA-2.2: Runoff Area=11,458 sf 72.29% Impervious Runoff Depth>2.22"
Flow Length=200' Tc=6.0 min CN=93 Runoff=0.69 cfs 0.049 af

Subcatchment SA-3: Runoff Area=2,698 sf 5.67% Impervious Runoff Depth>1.29"
Flow Length=75' Slope=0.0400 '/' Tc=6.0 min CN=81 Runoff=0.10 cfs 0.007 af

Subcatchment SA-3.1: Runoff Area=3,570 sf 100.00% Impervious Runoff Depth>2.68"
Tc=0.0 min CN=98 Runoff=0.28 cfs 0.018 af

Subcatchment SA-4: Runoff Area=4,788 sf 22.37% Impervious Runoff Depth>1.49"
Flow Length=82' Slope=0.0240 '/' Tc=7.9 min CN=84 Runoff=0.19 cfs 0.014 af

Subcatchment SA-4.1: Runoff Area=11,086 sf 81.24% Impervious Runoff Depth>2.41"
Tc=6.0 min CN=95 Runoff=0.70 cfs 0.051 af

Subcatchment SA-4.2: Runoff Area=3,131 sf 71.96% Impervious Runoff Depth>2.22"
Tc=0.0 min CN=93 Runoff=0.22 cfs 0.013 af

Subcatchment SA-4.3: Runoff Area=5,018 sf 83.12% Impervious Runoff Depth>2.41"
Flow Length=30' Slope=0.1000 '/' Tc=6.0 min CN=95 Runoff=0.32 cfs 0.023 af

Pond C-1: Peak Elev=36.94' Storage=21 cf Inflow=0.69 cfs 0.049 af
15.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=0.69 cfs 0.049 af

Pond CB K: Peak Elev=33.12' Inflow=1.38 cfs 0.147 af
18.0" Round Culvert n=0.013 L=66.0' S=0.0026 '/' Outflow=1.38 cfs 0.147 af

Pond CB L: Peak Elev=32.91' Inflow=2.10 cfs 0.395 af
24.0" Round Culvert n=0.012 L=58.0' S=0.0074 '/' Outflow=2.10 cfs 0.395 af

Pond CB-1: Peak Elev=32.96' Inflow=0.22 cfs 0.013 af
12.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.22 cfs 0.013 af

Pond CB-2: Peak Elev=36.89' Inflow=0.28 cfs 0.018 af
15.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=0.28 cfs 0.018 af

Pond CB-3: Peak Elev=33.55' Inflow=0.22 cfs 0.037 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0074 '/' Outflow=0.22 cfs 0.037 af

Pond CB-4: Peak Elev=34.03' Inflow=0.04 cfs 0.023 af
15.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=0.04 cfs 0.023 af

Pond CB-5: Peak Elev=36.73' Inflow=0.23 cfs 0.018 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=0.23 cfs 0.018 af

Pond DF-1: Peak Elev=36.39' Storage=417 cf Inflow=0.32 cfs 0.023 af
Primary=0.04 cfs 0.023 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.023 af

Pond DMH 1: Peak Elev=32.88' Inflow=0.35 cfs 0.197 af
15.0" Round Culvert n=0.013 L=35.0' S=0.0049 '/' Outflow=0.35 cfs 0.197 af

Pond DMH 2: Peak Elev=32.30' Inflow=0.22 cfs 0.037 af
18.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.22 cfs 0.037 af

Pond DMH 3: Peak Elev=33.16' Inflow=0.22 cfs 0.037 af
15.0" Round Culvert n=0.013 L=76.0' S=0.0100 '/' Outflow=0.22 cfs 0.037 af

Pond DMH E: Peak Elev=32.94' Inflow=1.62 cfs 0.344 af
24.0" Round Culvert n=0.013 L=33.0' S=-0.0070 '/' Outflow=1.62 cfs 0.344 af

Pond DMH G: Peak Elev=32.76' Inflow=2.32 cfs 0.432 af
24.0" Round Culvert n=0.012 L=80.0' S=0.0004 '/' Outflow=2.32 cfs 0.432 af

Pond FP-1: FocalPoint A Peak Elev=37.93' Storage=1,158 cf Inflow=1.95 cfs 0.141 af
Primary=0.28 cfs 0.119 af Secondary=0.99 cfs 0.022 af Outflow=1.27 cfs 0.141 af

Pond FP-2: FocalPoint B Peak Elev=37.88' Storage=700 cf Inflow=0.89 cfs 0.115 af
Primary=0.23 cfs 0.092 af Secondary=0.59 cfs 0.023 af Outflow=0.82 cfs 0.115 af

Pond P-1: Detention Pond Peak Elev=35.60' Storage=7,820 cf Inflow=1.83 cfs 0.308 af
Primary=0.27 cfs 0.184 af Secondary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.184 af

Pond RT-1: FP-1 R-Tanks Peak Elev=34.06' Storage=88 cf Inflow=0.28 cfs 0.119 af
Outflow=0.28 cfs 0.118 af

Pond RT-2: FP-1 R-Tanks Peak Elev=34.27' Storage=73 cf Inflow=0.23 cfs 0.092 af
Outflow=0.23 cfs 0.091 af

Pond SF-1: Soil Filter A Peak Elev=36.78' Storage=651 cf Inflow=0.34 cfs 0.025 af
Primary=0.01 cfs 0.012 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.012 af

Pond WET-2: Peak Elev=34.05' Storage=421 cf Inflow=1.64 cfs 0.147 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0158 '/' Outflow=1.38 cfs 0.147 af

Link AP-1: Inflow=2.32 cfs 0.432 af
Primary=2.32 cfs 0.432 af

Total Runoff Area = 3.681 ac Runoff Volume = 0.572 af Average Runoff Depth = 1.86"
49.57% Pervious = 1.825 ac 50.43% Impervious = 1.856 ac

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 SA-1: Runoff Area=30,654 sf 85.24% Impervious Runoff Depth>3.79"
Flow Length=216' Tc=6.0 min CN=95 Runoff=2.99 cfs 0.222 af

Subcatchment SA-1.1: Runoff Area=32,563 sf 52.65% Impervious Runoff Depth>3.17"
Flow Length=283' Tc=37.2 min CN=89 Runoff=1.49 cfs 0.197 af

Subcatchment SA-1.2: Runoff Area=22,052 sf 10.04% Impervious Runoff Depth>2.44"
Flow Length=200' Tc=27.5 min CN=81 Runoff=0.92 cfs 0.103 af

Subcatchment SA-2: Runoff Area=29,790 sf 11.83% Impervious Runoff Depth>2.37"
Flow Length=197' Tc=12.4 min CN=80 Runoff=1.65 cfs 0.135 af

Subcatchment SA-2.1: Runoff Area=3,534 sf 94.51% Impervious Runoff Depth>3.97"
Flow Length=95' Slope=0.0030 '/' Tc=6.0 min CN=97 Runoff=0.35 cfs 0.027 af

Subcatchment SA-2.2: Runoff Area=11,458 sf 72.29% Impervious Runoff Depth>3.60"
Flow Length=200' Tc=6.0 min CN=93 Runoff=1.08 cfs 0.079 af

Subcatchment SA-3: Runoff Area=2,698 sf 5.67% Impervious Runoff Depth>2.46"
Flow Length=75' Slope=0.0400 '/' Tc=6.0 min CN=81 Runoff=0.19 cfs 0.013 af

Subcatchment SA-3.1: Runoff Area=3,570 sf 100.00% Impervious Runoff Depth>4.05"
Tc=0.0 min CN=98 Runoff=0.42 cfs 0.028 af

Subcatchment SA-4: Runoff Area=4,788 sf 22.37% Impervious Runoff Depth>2.72"
Flow Length=82' Slope=0.0240 '/' Tc=7.9 min CN=84 Runoff=0.35 cfs 0.025 af

Subcatchment SA-4.1: Runoff Area=11,086 sf 81.24% Impervious Runoff Depth>3.79"
Tc=6.0 min CN=95 Runoff=1.08 cfs 0.080 af

Subcatchment SA-4.2: Runoff Area=3,131 sf 71.96% Impervious Runoff Depth>3.60"
Tc=0.0 min CN=93 Runoff=0.35 cfs 0.022 af

Subcatchment SA-4.3: Runoff Area=5,018 sf 83.12% Impervious Runoff Depth>3.79"
Flow Length=30' Slope=0.1000 '/' Tc=6.0 min CN=95 Runoff=0.49 cfs 0.036 af

Pond C-1: Peak Elev=37.06' Storage=35 cf Inflow=1.08 cfs 0.079 af
15.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=1.08 cfs 0.079 af

Pond CB K: Peak Elev=33.30' Inflow=2.12 cfs 0.362 af
18.0" Round Culvert n=0.013 L=66.0' S=0.0026 '/' Outflow=2.12 cfs 0.362 af

Pond CB L: Peak Elev=33.09' Inflow=3.22 cfs 0.690 af
24.0" Round Culvert n=0.012 L=58.0' S=0.0074 '/' Outflow=3.22 cfs 0.690 af

Pond CB-1: Peak Elev=33.04' Inflow=0.35 cfs 0.022 af
12.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.35 cfs 0.022 af

Pond CB-2: Peak Elev=36.96' Inflow=0.42 cfs 0.028 af
15.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=0.42 cfs 0.028 af

Pond CB-3: Peak Elev=33.62' Inflow=0.38 cfs 0.057 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0074 '/' Outflow=0.38 cfs 0.057 af

Pond CB-4: Peak Elev=34.03' Inflow=0.04 cfs 0.032 af
15.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=0.04 cfs 0.032 af

Pond CB-5: Peak Elev=36.79' Inflow=0.35 cfs 0.027 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=0.35 cfs 0.027 af

Pond DF-1: Peak Elev=37.51' Storage=735 cf Inflow=0.49 cfs 0.036 af
Primary=0.04 cfs 0.032 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.032 af

Pond DMH 1: Peak Elev=32.95' Inflow=0.52 cfs 0.248 af
15.0" Round Culvert n=0.013 L=35.0' S=0.0049 '/' Outflow=0.52 cfs 0.248 af

Pond DMH 2: Peak Elev=32.37' Inflow=0.38 cfs 0.057 af
18.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.38 cfs 0.057 af

Pond DMH 3: Peak Elev=33.23' Inflow=0.38 cfs 0.057 af
15.0" Round Culvert n=0.013 L=76.0' S=0.0100 '/' Outflow=0.38 cfs 0.057 af

Pond DMH E: Peak Elev=33.09' Inflow=2.45 cfs 0.610 af
24.0" Round Culvert n=0.013 L=33.0' S=-0.0070 '/' Outflow=2.45 cfs 0.610 af

Pond DMH G: Peak Elev=32.98' Inflow=3.61 cfs 0.748 af
24.0" Round Culvert n=0.012 L=80.0' S=0.0004 '/' Outflow=3.61 cfs 0.748 af

Pond FP-1: FocalPoint A Peak Elev=38.04' Storage=1,247 cf Inflow=2.99 cfs 0.222 af
Primary=0.28 cfs 0.160 af Secondary=2.00 cfs 0.055 af Outflow=2.28 cfs 0.215 af

Pond FP-2: FocalPoint B Peak Elev=37.96' Storage=795 cf Inflow=1.49 cfs 0.197 af
Primary=0.23 cfs 0.130 af Secondary=1.24 cfs 0.068 af Outflow=1.47 cfs 0.198 af

Pond P-1: Detention Pond Peak Elev=36.19' Storage=10,772 cf Inflow=3.24 cfs 0.514 af
Primary=0.31 cfs 0.226 af Secondary=0.57 cfs 0.108 af Outflow=0.88 cfs 0.335 af

Pond RT-1: FP-1 R-Tanks Peak Elev=34.06' Storage=88 cf Inflow=0.28 cfs 0.160 af
Outflow=0.28 cfs 0.158 af

Pond RT-2: FP-1 R-Tanks Peak Elev=34.27' Storage=73 cf Inflow=0.23 cfs 0.130 af
Outflow=0.23 cfs 0.129 af

Pond SF-1: Soil Filter A Peak Elev=37.30' Storage=1,218 cf Inflow=0.54 cfs 0.040 af
Primary=0.01 cfs 0.013 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.013 af

Pond WET-2: Peak Elev=34.33' Storage=939 cf Inflow=2.85 cfs 0.362 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0158 '/' Outflow=2.12 cfs 0.362 af

Link AP-1: Inflow=3.61 cfs 0.748 af
Primary=3.61 cfs 0.748 af

Total Runoff Area = 3.681 ac Runoff Volume = 0.967 af Average Runoff Depth = 3.15"
49.57% Pervious = 1.825 ac 50.43% Impervious = 1.856 ac

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 SA-1: Runoff Area=30,654 sf 85.24% Impervious Runoff Depth>4.90"
Flow Length=216' Tc=6.0 min CN=95 Runoff=3.82 cfs 0.287 af

Subcatchment SA-1.1: Runoff Area=32,563 sf 52.65% Impervious Runoff Depth>4.26"
Flow Length=283' Tc=37.2 min CN=89 Runoff=1.97 cfs 0.265 af

Subcatchment SA-1.2: Runoff Area=22,052 sf 10.04% Impervious Runoff Depth>3.45"
Flow Length=200' Tc=27.5 min CN=81 Runoff=1.29 cfs 0.145 af

Subcatchment SA-2: Runoff Area=29,790 sf 11.83% Impervious Runoff Depth>3.37"
Flow Length=197' Tc=12.4 min CN=80 Runoff=2.33 cfs 0.192 af

Subcatchment SA-2.1: Runoff Area=3,534 sf 94.51% Impervious Runoff Depth>5.07"
Flow Length=95' Slope=0.0030 '/' Tc=6.0 min CN=97 Runoff=0.45 cfs 0.034 af

Subcatchment SA-2.2: Runoff Area=11,458 sf 72.29% Impervious Runoff Depth>4.70"
Flow Length=200' Tc=6.0 min CN=93 Runoff=1.40 cfs 0.103 af

Subcatchment SA-3: Runoff Area=2,698 sf 5.67% Impervious Runoff Depth>3.47"
Flow Length=75' Slope=0.0400 '/' Tc=6.0 min CN=81 Runoff=0.26 cfs 0.018 af

Subcatchment SA-3.1: Runoff Area=3,570 sf 100.00% Impervious Runoff Depth>5.15"
Tc=0.0 min CN=98 Runoff=0.53 cfs 0.035 af

Subcatchment SA-4: Runoff Area=4,788 sf 22.37% Impervious Runoff Depth>3.77"
Flow Length=82' Slope=0.0240 '/' Tc=7.9 min CN=84 Runoff=0.47 cfs 0.035 af

Subcatchment SA-4.1: Runoff Area=11,086 sf 81.24% Impervious Runoff Depth>4.90"
Tc=6.0 min CN=95 Runoff=1.38 cfs 0.104 af

Subcatchment SA-4.2: Runoff Area=3,131 sf 71.96% Impervious Runoff Depth>4.71"
Tc=0.0 min CN=93 Runoff=0.45 cfs 0.028 af

Subcatchment SA-4.3: Runoff Area=5,018 sf 83.12% Impervious Runoff Depth>4.90"
Flow Length=30' Slope=0.1000 '/' Tc=6.0 min CN=95 Runoff=0.63 cfs 0.047 af

Pond C-1: Peak Elev=37.15' Storage=45 cf Inflow=1.40 cfs 0.103 af
15.0" Round Culvert n=0.013 L=32.0' S=0.0100 '/' Outflow=1.40 cfs 0.103 af

Pond CB K: Peak Elev=33.39' Inflow=2.54 cfs 0.541 af
18.0" Round Culvert n=0.013 L=66.0' S=0.0026 '/' Outflow=2.54 cfs 0.541 af

Pond CB L: Peak Elev=33.20' Inflow=4.06 cfs 0.975 af
24.0" Round Culvert n=0.012 L=58.0' S=0.0074 '/' Outflow=4.06 cfs 0.975 af

Pond CB-1: Peak Elev=33.09' Inflow=0.45 cfs 0.028 af
12.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.45 cfs 0.028 af

Pond CB-2: Peak Elev=37.01' Inflow=0.53 cfs 0.035 af
15.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=0.53 cfs 0.035 af

Pond CB-3: Peak Elev=33.68' Inflow=0.51 cfs 0.072 af
15.0" Round Culvert n=0.012 L=38.0' S=0.0074 '/' Outflow=0.51 cfs 0.072 af

Pond CB-4: Peak Elev=34.04' Inflow=0.05 cfs 0.038 af
15.0" Round Culvert n=0.013 L=78.0' S=0.0051 '/' Outflow=0.05 cfs 0.038 af

Pond CB-5: Peak Elev=36.83' Inflow=0.45 cfs 0.034 af
15.0" Round Culvert n=0.013 L=25.0' S=0.0100 '/' Outflow=0.45 cfs 0.034 af

Pond DF-1: Peak Elev=38.47' Storage=1,006 cf Inflow=0.63 cfs 0.047 af
Primary=0.05 cfs 0.038 af Secondary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.038 af

Pond DMH 1: Peak Elev=33.31' Inflow=1.71 cfs 0.330 af
15.0" Round Culvert n=0.013 L=35.0' S=0.0049 '/' Outflow=1.71 cfs 0.330 af

Pond DMH 2: Peak Elev=32.41' Inflow=0.51 cfs 0.072 af
18.0" Round Culvert n=0.013 L=23.0' S=0.0100 '/' Outflow=0.51 cfs 0.072 af

Pond DMH 3: Peak Elev=33.27' Inflow=0.51 cfs 0.072 af
15.0" Round Culvert n=0.013 L=76.0' S=0.0100 '/' Outflow=0.51 cfs 0.072 af

Pond DMH E: Peak Elev=33.33' Inflow=3.90 cfs 0.871 af
24.0" Round Culvert n=0.013 L=33.0' S=-0.0070 '/' Outflow=3.90 cfs 0.871 af

Pond DMH G: Peak Elev=33.11' Inflow=4.44 cfs 1.047 af
24.0" Round Culvert n=0.012 L=80.0' S=0.0004 '/' Outflow=4.44 cfs 1.047 af

Pond FP-1: FocalPoint A Peak Elev=38.13' Storage=1,247 cf Inflow=3.82 cfs 0.287 af
Primary=0.28 cfs 0.189 af Secondary=2.97 cfs 0.088 af Outflow=3.25 cfs 0.277 af

Pond FP-2: FocalPoint B Peak Elev=38.02' Storage=843 cf Inflow=1.97 cfs 0.265 af
Primary=0.23 cfs 0.155 af Secondary=1.81 cfs 0.111 af Outflow=2.04 cfs 0.266 af

Pond P-1: Detention Pond Peak Elev=36.39' Storage=11,803 cf Inflow=4.41 cfs 0.686 af
Primary=1.67 cfs 0.302 af Secondary=1.22 cfs 0.192 af Outflow=2.88 cfs 0.494 af

Pond RT-1: FP-1 R-Tanks Peak Elev=34.06' Storage=88 cf Inflow=0.28 cfs 0.189 af
Outflow=0.28 cfs 0.188 af

Pond RT-2: FP-1 R-Tanks Peak Elev=34.27' Storage=73 cf Inflow=0.23 cfs 0.155 af
Outflow=0.23 cfs 0.154 af

Pond SF-1: Soil Filter A Peak Elev=37.51' Storage=1,479 cf Inflow=0.70 cfs 0.053 af
Primary=0.01 cfs 0.014 af Secondary=0.04 cfs 0.006 af Outflow=0.05 cfs 0.020 af

Pond WET-2: Peak Elev=34.55' Storage=1,581 cf Inflow=3.87 cfs 0.541 af
12.0" Round Culvert n=0.012 L=45.0' S=0.0158 '/' Outflow=2.54 cfs 0.541 af

Link AP-1: Inflow=4.44 cfs 1.047 af
Primary=4.44 cfs 1.047 af

Total Runoff Area = 3.681 ac Runoff Volume = 1.294 af Average Runoff Depth = 4.22"
49.57% Pervious = 1.825 ac 50.43% Impervious = 1.856 ac

Appendix D
Water Quality Calculations

BH2M
380B Main Street
Gorham, Maine 04038

WATER QUALITY CALCULATIONS
Tidewater Village TV3

Subcatchment ID	Proposed Impervious Area (sf)	Proposed Landscaped Area (sf)	Proposed Developed Area (sf)	Existing Impervious Area (sf)	Existing Landscaped Area (sf)	Treated Impervious Area (sf)	Treated Developed Area (sf)	BMP ID
1	26,128	4,526	30,654	0	0	26,128	30,654	Focal Point A
1.1	10,043	8,005	18,048	7,101	7,414	17,144	32,563	Focal Point B
1.2	0	8,934	8,934	2,214	10,904	0	0	None
2	889	4,500	5,389	2,634	21,767	0	0	None
2.1	0	0	0	3,340	194	0	0	None
2.2	0	1,230	1,230	8,283	1,945	0	0	None
3	153	2,545	2,698	0	0	153	2,698	Soil Filter A
3.1	3,570	0	3,570	0	0	3,570	3,570	Soil Filter A
4	1,071	3,717	4,788	0	0	0	0	None
4.1	5,583	1,841	7,424	3,423	239	0	0	None
4.2	2,253	878	3,131	0	0	0	0	None
4.3	4,171	847	5,018	0	0	4,171	5,018	Roof Dripline Filter
Total	**53,861**	**37,023**	**90,884**	**26,995**	**42,463**	**51,166**	**74,503**	

Treatment credit for existing imp = 7,107 sf, existing grass = 7,414sf; developed = 28,087 sf

New Development Treatment Summary	
Total Proposed Impervious Area (sq. ft.)=	53,861
Total Proposed Developed Area (sq. ft.)=	90,884
* Total Treated Impervious Area (sq. ft.)=	51,166
* Total Treated Developed Area (sq. ft.)=	74,503
***Impervious Area Treatment % =**	**95.00%**
Developed Area Treatment % =	**81.98%**

Grassed Underdrained Soil Filter A

Subcatchment ID	Impervious Area (sf)	WQ Impervious Area Runoff Depth (inches)*	WQ Impervious Volume Required (ft3)	Landscaped Area (sf)	WQ Landscape Area Runoff Depth (inches)	WQ Landscape Volume Required (ft^3)	Total WQ Volume Required (ft^3)
3	153	1.00	13	2,545	0.40	85	98
3.1	3,570	1.00	298	0	0.40	0	298
Total	**3,723**		**310**	**2,545**		**85**	**395**

Summary of Underdrain Filter Sizing	
Total WQ Volume Required (ft^3)	395
WQ Volume Provided (ft^3)	**1,455**
Filter Surface Elevation	36.00
WQ Surface Elevation	37.50
Invert of Underdrain	33.67
5% of Tributary Impervious Area (ft^2)	186
2% of Tributary Landscaped (ft^2)	51
Filter Surface Area Required (ft^2)	237
Filter Surface Area Provided (ft^2)	**696**

Underdrain Filter Volume				
Elevation	Surface Area (ft^2)	Average Stage Area (ft^2)	Stage Volume (ft^3)	Cumulative Volume (ft^3)
36	696			0
37	1,063	880	880	880
37.5	1,240	1,152	576	1,455
38	1,505	1,373	686	2,142
Water Quality Volume Provided (at Elevation 37.50) =				**1,455**

Orifice Sizing	
Discharge Coefficient	0.62
Orifice Size (inches)	0.5
Orifice Size (feet)	0.04
Orifice Area (ft^2)	0.001
Orifice Centerline Elevation	33.92

Orifice Eqn: $C*A*(2gH)^{1/2}$

Q (cfs)	Stage Elevation	Total Drawdown at Stage	Pond Area	Drawdown Time (hrs)
0.0098	**36**	**0.00**	**696**	**0.00**
0.0119	**37**	**1.00**	**1,063**	**24.82**
0.0128	**37.5**	**0.50**	**1,240**	**13.43**
			Total Drawdown Time =	**38.25**

Required Sediment Storage		
Area to be Sanded	0.00	acres
Sand Used per Storm	500	lbs/acre-storm
Weight of Sand	90	lbs/cf
# of Storms per Year	10	storms/year
Sediment Storage Required	**0.20**	**cf/year**

Provided Storage Volume		
Total # of CB's	0	
Sump Depth	2	ft
CB Diameter	4	ft
CB Sediment Storage Volume	0.00	cf
Forebay Volume	25	cf
Total Volume	**25.00**	**cf**

Roof Dripline Filter Drawdown Calculations

Drip Edge Filter Storage				
Elevation	**Surface Area (ft^2)**	**Average Stage Area (ft^2)**	**Stage Volume (ft^3)**	**Cumulative Volume (ft^3)**
33.92	709			0
34.92	709	709	709	709
35.92	709	709	709	1,418
36.92	709	709	709	2,127
37.92	709	709	709	2,836
39	709	709	766	3,602
Total Volume Provided				3,602

Orifice Sizing	
Invert of Underdrain	33.52
Discharge Coefficient	0.62
Orifice Size (inches)	0.875
Orifice Size (feet)	0.07
Orifice Area (ft^2)	0.004
Orifice Centerline Elevation	33.77

Orifice Eqn: $C*A*(2gH)^{1/2}$

Q (cfs)	Stage Elevation	Total Drawdown at Stage	Pond Area	Drawdown Time (hrs)
0.0080	**33.92**	**0.00**	**709**	**0.00**
0.0223	**34.92**	**1.00**	**709**	**8.85**
0.0304	**35.92**	**1.00**	**709**	**6.47**
0.0368	**36.92**	**1.00**	**709**	**5.34**
0.0423	**37.92**	**1.00**	**709**	**4.66**
0.0475	**39**	**1.08**	**709**	**4.48**
		Total Drawdown Time =		**29.80**

Summary for Pond DF-1:

Inflow Area = 0.115 ac, 83.12% Impervious, Inflow Depth > 4.90" for 25-year event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 0.047 af
Outflow = 0.05 cfs @ 13.16 hrs, Volume= 0.036 af, Atten= 92%, Lag= 64.3 min
Primary = 0.05 cfs @ 13.16 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 38.64' @ 13.16 hrs Surf.Area= 1,418 sf Storage= 1,054 cf

Plug-Flow detention time= 192.0 min calculated for 0.036 af (77% of inflow)
Center-of-Mass det. time= 132.8 min (875.6 - 742.7)

Volume	Invert	Avail.Storage	Storage Description
#1	33.92'	284 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 1,418 cf Overall x 20.0% Voids
#2	35.92'	873 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 2,184 cf Overall x 40.0% Voids
		1,157 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.92	709	0	0
34.92	709	709	709
35.92	709	709	1,418

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.92	709	0	0
36.92	709	709	709
37.92	709	709	1,418
39.00	709	766	2,184

Device	Routing	Invert	Outlet Devices
#1	Primary	33.92'	**4.0" Round Culvert** L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.92' / 33.52' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Device 1	33.52'	**0.9" Vert. Orifice/Grate** C= 0.620

Primary OutFlow Max=0.05 cfs @ 13.16 hrs HW=38.64' (Free Discharge)
└**1=Culvert** (Passes 0.05 cfs of 0.54 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 10.81 fps)

Dry Pond Channel Protection Volume

Per Maine DEP Chapter 500, Appendix E-3-a, dry ponds must retain a water quality volume for the 1-year event to be released over a 12 hour period.

Volume from Focalpoint Units: 0.203 Acre Feet; 8842 ft^3

Orifice Sizing	
Discharge Coefficient	0.62
Orifice Size (inches)	2.75
Orifice Size (feet)	0.23
Orifice Area (ft^2)	0.041
Orifice Centerline Elevation	33.85

Detention Pond Volume				
Elevation	Surface Area (ft^2)	Average Stage Area (ft^2)	Stage Volume (ft^3)	Cumulative Volume (ft^3)
33.6	2,770			0
34	3,480	3,125	1,250	1,250
35	4,245	3,863	3,863	5,113
35.82	4,974	4,610	3,780	8,892
36	5,021	5,021	904	9,796
37	6,183	5,625	5,625	15,421

Channel Protection Volume Provided (at Elevation 35.82) =	8,892

Orifice Eqn: $C*A*(2gH)^{1/2}$

Q (cfs)	Stage Elevation	Total Drawdown at Stage	Pond Area	Drawdown Time (hrs)
0.0794	34	0.40	3,480	4.87
0.2199	35.00	1.00	4,245	5.36
0.2878	35.82	0.82	4,974	3.94
			Total Drawdown Time =	14.17

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 SA-1: Runoff Area=30,654 sf 85.24% Impervious Runoff Depth>1.95"
Flow Length=216' Tc=6.0 min CN=95 Runoff=1.59 cfs 0.114 af

Subcatchment SA-1.1: Runoff Area=32,563 sf 52.65% Impervious Runoff Depth>1.43"
Flow Length=283' Tc=37.2 min CN=89 Runoff=0.69 cfs 0.089 af

Total Runoff Area = 1.451 ac Runoff Volume = 0.203 af Average Runoff Depth = 1.68"
31.55% Pervious = 0.458 ac 68.45% Impervious = 0.993 ac

FERGUSON WATERWORKS

FOCALPOINT A

FOCALPOINT DESIGN SHEET

HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM
MAINE CHAPTER 500 PROJECTS



1. Determine FocalPoint bed area (minimum 174 sf/acre of impervious area - ex: 0.2 acres = 35 sf)
See step 2 to determine if minimum size is appropriate.

- Tributary impervious area: = 0.600 ac **(A)**
- Tributary pervious area: = 0.098 ac **(B)**
- Minimum FocalPoint bed area required: **= ((A x 1.0) + (B x 0.4)) * 174** = 111.22 sf
- FocalPoint bed area provided*: = 120 sf
- Dimensions of proposed FocalPoint: = 10 ft x 12 ft

2. A 0.95 in Type III 24-hr rainfall event shall be modelled to demonstrate the entire storm volume is treated prior to activation of the overflow (typically set at 6 - 12 in above the mulch)

- Temporary storage depth provided: = 6 in
  (typically 6 - 12 in)
- Temporary storage volume provided at above depth: = 342 ft^3
- Peak ponding depth from 0.95" 24 hr storm event: = 0.24 in

3. Ratio of the surface area of the filter media (sf) to the temporary ponding volume (cf) shall be no less than 1:5

- Ratio of FocalPoint bed area: = 1 : 2.85

4. Subsurface R-Tank or chamber treatment row must be sized to treat the peak flow from a 1 yr - 24-hr storm event.

- 1 yr 24-hr peak flowrate: = 1.59 cfs
- Chamber/module selected:
  - Cultec 330 XLHD (1 chamber per 0.227 cfs) ☐
  - Cultec 150 XLHD (1 chamber per 0.185 cfs) ☐
  - R-Tank modules (WHAT TYPE)(1 module per 0.02 cfs) ☑
- Number of chamber/modules required: = 79.5

PER FERGUSON REVIEW LETTER, MODULES ONLY REQUIRED UNDER MEDIA.

5. Controlled release of the channel protection over 24 - 48 hrs

- Controlled realease of the channel protection volume is being achieved by:
  - Expanded subsurface storage basin with outlet control structure (OCS) ☐
  - Surface detention basin with OCS ☑

6. A landscape plan for the FocalPoint bed area has been prepared ☐

7. Design review and installation oversight by manufacturer's representative

- The design has been reviewed by Ferguson ☐
- Engineer will coordinate installation inspection with Ferguson ☐

Contact Loren Joyce - Stormwater Engineer
Cell: 207.272.9743 | Email: loren.joyce@ferguson.com

FERGUSON WATERWORKS

FERGUSON WATERWORKS

FOCALPOINT B

FOCALPOINT DESIGN SHEET

HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM

MAINE CHAPTER 500 PROJECTS



1. **Determine FocalPoint bed area (minimum 174 sf/acre of impervious area - ex: 0.2 acres = 35 sf)**
   See step 2 to determine if minimum size is appropriate.
   - Tributary impervious area: = 0.434 ac **(A)**
   - Tributary pervious area: = 0.349 ac **(B)**
   - Minimum FocalPoint bed area required: **= ((A x 1.0) + (B x 0.4)) * 174** = 99.8 sf
   - FocalPoint bed area provided*: = 100 sf
   - Dimensions of proposed FocalPoint: = 10 ft x 10 ft

2. **A 0.95 in Type III 24-hr rainfall event shall be modelled to demonstrate the entire storm volume is treated prior to activation of the overflow (typically set at 6 - 12 in above the mulch)**
   - Temporary storage depth provided: = 6 in
     (typically 6 - 12 in)
   - Temporary storage volume provided at above depth: = 292 ft^3
   - Peak ponding depth from 0.95" 24 hr storm event: = _____ in

3. **Ratio of the surface area of the filter media (sf) to the temporary ponding volume (cf) shall be no less than 1:5**
   - Ratio of FocalPoint bed area: = 1 : 2.92

4. **Subsurface R-Tank or chamber treatment row must be sized to treat the peak flow from a 1 yr - 24-hr storm event.**
   - 1 yr 24-hr peak flowrate: = .76 cfs
   - Chamber/module selected:
     - Cultec 330 XLHD (1 chamber per 0.227 cfs) ☐
     - Cultec 150 XLHD (1 chamber per 0.185 cfs) ☐
     - R-Tank modules (WHAT TYPE)(1 module per 0.02 cfs) ☑
   - Number of chamber/modules required: = 38

PER FERGUSON REVIEW LETTER, MODULES ONLY REQUIRED UNDER MEDIA.

5. **Controlled release of the channel protection over 24 - 48 hrs**
   - Controlled realease of the channel protection volume is being achieved by:
     - Expanded subsurface storage basin with outlet control structure (OCS) ☐
     - Surface detention basin with OCS ☐

6. **A landscape plan for the FocalPoint bed area has been prepared** ☐

7. **Design review and installation oversight by manufacturer's representative**
   - The design has been reviewed by Ferguson ☐
   - Engineer will coordinate installation inspection with Ferguson ☐

Contact Loren Joyce - Stormwater Engineer
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FERGUSON WATERWORKS

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380B Main Street
Gorham, ME 04038

February 5th, 2026

SUBJECT: Tidwater Village TV 3 - Focal Point Design
FocalPoint Biofilter Design Review and Construction Oversight

Dear Christopher,

Thank you for forwarding the plans for the proposed mixed-use commercial and residential development project in Falmouth, Maine to Ferguson Waterworks for review. Our team has reviewed FocalPoint plan sheets with the revision month of January 2026, as well as stormwater report, which shows the following FocalPoint systems:

- FocalPoint A Stormwater Treatment System – 120 SF with 15" domed overflow
- FocalPoint B Stormwater Treatment System – 100 SF with 15" domed overflow

Ferguson provides the following review comments:

- The FocalPoint system is set in a recessed vegetated 'bowl' area providing a temporary ponding volume.
- FocalPoint filter bed area is computed correctly according to the sizing criteria approved by MEDEP.
- HydroCAD modeling shows the system is sized to be able to treat the full runoff volume of the 0.95" rainfall event prior to bypass.
- The systems are proposed along the curbline to receive runoff from adjacent parking areas. FocalPoint A treats runoff from 30,654 SF of drainage area (26,128 SF impervious), and FocalPoint B treats runoff from 32,563 SF (17,144 SF impervious). Runoff concentrates along the curbline and discharges into recessed bowls at each system. A 2' wide stone berm provides pretreatment and energy dissipation for both systems prior to treatment within the FocalPoint systems.

- The details show the typical FocalPoint section consisting of 3" mulch, 18" media, 6" bridging stone and modular underdrain. For this project, the underdrain consists of R-Tank^{SD} Single underdrain modules.
- A 15" dia. domed overflow structure is provided to convey larger storm events – essentially as a bypass.
- A dry detention basin is located downstream of the FocalPoint to meet the requirements of both channel protection and flooding standards.
- Please ensure a landscape plan is prepared including required plantings for the FocalPoint bed areas.

Ferguson has discussed the use of the standard R-Tank^{SD} modules in-lieu of the traditionally proposed R-Tank^{HD} treatment row modules with Maine DEP. Given that a dry detention basin is located downstream of the propose FocalPoint systems, the requirement for utilizing treatment row modules can be waived. Standard R-Tank^{SD} underdrain modules are acceptable to be utilized in a footprint that occupies a similar footprint as the FocalPoint media.

Overall, Ferguson takes no exceptions to the location and application of the FocalPoint system for this project to provide WQ treatment only.

With regard to the installation, Ferguson Waterworks will host a preconstruction meeting with the site contractor and will be on-site during the entire installation to ensure that the installation is being conducted in accordance with our standard installation procedures.

Please review and contact me with any questions from your office. We look forward to working with you on this project.

Sincerely,
Sam Wojichowski
Engineered Solutions Specialist – Ferguson Waterworks

Cc: Rob Woodman,
Director – Engineering & Green Stormwater Infrastructure

Appendix E
Test Pit Information

MARK HAMPTON ASSOCIATES, INC.

SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

8506

December 18, 2025

Mr. Chris MacDonald
BH2M
380 B Main Street
Gorham, ME 04038

Re: Soil Test Pit Evaluation, Stormwater Management, Clearwater Drive, Falmouth, ME

Dear Chris,

I completed evaluation of five backhoe dug test pits for the proposed stormwater treatment program for development activities for the proposed development on Clearwater Drive Falmouth, ME. The soil evaluation was conducted in accordance with Section 7.D.4 of the Stormwater Management Rules.

The soils evaluated were somewhat poorly and moderately well drained marine lacustrine soils. A limiting factor was found in the test pits ranging from 12 to 20 inches. The soil test pit log descriptions are attached. The hydrological soil group for all the soil test pits is noted on the soil logs.

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

Sincerely,

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



Enc.

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

Quality services that meet your deadline

8506

PAGE 1 OF 1

FORM F (SS2) Rev. 7/21

SOIL PROFILE / CLASSIFICATION INFORMATION

SOIL SCIENTIST DESCRIPTION OF SOIL CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Clearwater Drive	BH2M	Falmouth

Exploration Symbol # STW-1 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

100 " Depth: ☒ of exploration, or ☐ to refusal

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	Fine Sandy Loam	Fine Grand	Friable	
Bw1	Brown	Silt Loam	Fine Grand	Friable	
Bw2	Olive	Silty Clay Loam	Fine Grand	Firm	Common and Distinct
Cg	Olive	Silty Clay	Massive	Firm	

Depth below mineral soil horizon *(inches)*

Limit of Excavation 100 inches

Groundwater Observed at 72 inches

Soil Details ▶▶

Soil Series/Phase Name:	Limiting Factor		Drainage Class	Slope	Hydric Soil	Hydrologic
Lamoine	14 " Depth	☒ Groundwater ☒ Restrictive Layer ☐ Bedrock	☐ ED ☐ SED ☐ WD ☐ MWD ☒ SPD ☐ PD ☐ VPD	2 Percent	☒ No ☐ Yes	D Soil Group

Exploration Symbol # STW-2 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

61 " Depth: ☒ of exploration, or ☐ to refusal

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Fine Grand	Friable	
Bw1	Brown	Silt Loam	Fine Grand	Friable	
Bw2	Olive	Silty Clay Loam	Fine Grand	Firm	Common and Distinct
Cg	Olive	Silty Clay	Massive	Firm	

Depth below mineral soil horizon *(inches)*

Limit of Excavation 61 inches

No Groundwater Observed

Soil Details ▶▶

Soil Series/Phase Name:	Limiting Factor		Drainage Class	Slope	Hydric Soil	Hydrologic
Lamoine	12 " Depth	☒ Groundwater ☒ Restrictive Layer ☐ Bedrock	☐ ED ☐ SED ☐ WD ☐ MWD ☒ SPD ☐ PD ☐ VPD	2 Percent	☒ No ☐ Yes	D Soil Group

SOIL SCIENTIST INFORMATION AND SIGNATURE

Signature

Mark J. Hampton

Name Printed

12/16/2025

Date

216

SS License No.

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

official professional seal

8506

PAGE 1 OF 1

FORM F (SS2) Rev. 7/21

SOIL PROFILE / CLASSIFICATION INFORMATION

SOIL SCIENTIST DESCRIPTION OF SOIL CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Clearwater Drive	BH2M	Falmouth

Exploration Symbol # STW-3 ☒ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

76 " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon *(inches)*

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	Fine Sandy Loam	Fine Grand	Friable	
Bw1	Brown	Silt Loam	Fine Grand	Friable	
Bw2	Olive	Silty Clay Loam	Fine Grand	Firm	Common and Distinct
C	Olive	Silty Clay	Massive	Firm	

Limit of Excavation 76 inches

No Groundwater Observed

Soil Details

Soil Series/Phase Name:	Limiting Factor	Drainage Class	Slope	Hydric Soil	Hydrologic
Buxton	16 " Depth ☒ Groundwater ☒ Restrictive Layer ☐ Bedrock	☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☐ PD ☐ VPD	2 Percent	☒ No ☐ Yes	D Soil Group

Exploration Symbol # STW-4 ☒ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

80 " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon *(inches)*

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Fine Grand	Friable	
Bw1	Brown	Silt Loam	Fine Grand	Friable	
Bw2	Olive	Silty Clay Loam	Fine Grand	Firm	Common and Distinct
C	Olive	Silty Clay	Massive	Firm	

Limit of Excavation 80 inches

No Groundwater Observed

Soil Details

Soil Series/Phase Name:	Limiting Factor	Drainage Class	Slope	Hydric Soil	Hydrologic
Buxton	20 " Depth ☒ Groundwater ☒ Restrictive Layer ☐ Bedrock	☐ ED ☐ SED ☐ WD ☐ MWD ☒ SPD ☐ PD ☐ VPD	2 Percent	☒ No ☐ Yes	D Soil Group

SOIL SCIENTIST INFORMATION AND SIGNATURE

Mark J. Hampton

Signature

Mark J. Hampton

Name Printed

12/16/2025

Date

216

SS License No.

STATE OF MAINE
MARK J. HAMPTON #216
CERTIFIED SOIL SCIENTIST
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PAGE 1 OF 1

FORM F (SS2) Rev. 7/21

SOIL PROFILE / CLASSIFICATION INFORMATION

SOIL SCIENTIST DESCRIPTION OF SOIL CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Clearwater Drive	BH2M	Falmouth

Exploration Symbol # STW-5 ☒ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

52 " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon *(inches)*

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	Fine Sandy Loam	Fine Grand	Friable	
Bw1	Brown	Silt Loam	Fine Grand	Friable	
Bw2	Olive	Silty Clay Loam	Fine Grand	Firm	Common and Distinct
C	Olive	Silty Clay	Massive	Firm	

Limit of Excavation 76 inches

No Groundwater Observed

Soil Details

Soil Series/Phase Name:	Limiting Factor	Drainage Class	Slope	Hydric Soil	Hydrologic
Buxton	16 " Depth; ☒ Groundwater, ☒ Restrictive Layer, ☐ Bedrock	☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☐ PD ☐ VPD	2 Percent	☒ No ☐ Yes	D Soil Group

Exploration Symbol # _____ ☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth: ☐ of exploration, or ☐ to refusal

Depth below mineral soil horizon *(inches)*

Horizon	Color	Texture	Structure	Consistence	Redox

Soil Details

Soil Series/Phase Name:	Limiting Factor	Drainage Class	Slope	Hydric Soil	Hydrologic
	" Depth; ☐ Groundwater, ☐ Restrictive Layer, ☐ Bedrock	☐ ED ☐ SED ☐ WD ☐ MWD ☐ SPD ☐ PD ☐ VPD	Percent	☐ No ☐ Yes	Soil Group

SOIL SCIENTIST INFORMATION AND SIGNATURE

Signature

Mark J. Hampton

Name Printed

12/16/2025

Date

216

SS License No.

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

affix professional seal

Appendix F
Inspection and Maintenance Manual

EROSION AND SEDIMENTATION CONTROL

INSPECTION AND MAINTENANCE PLAN

Tidewater Village TV3
Clearwater Drive
Falmouth, Maine

Submitted by:

Empire Development, LLC
417 Falmouth Road # 1
Falmouth, Maine 04105

Prepared by:

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

Date:
January 2026

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APPENDIX B	Construction Inspection Forms
APPENDIX C	Post-Construction Inspection Forms
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APPENDIX E	Post Construction – Maintenance of Stormwater Management Systems
APPENDIX F	Focal Point Operation and Maintenance
APPENDIX G	Stormwater Report Narrative
APPENDIX H	Permit Order

1.0 INTRODUCTION

The intent of this plan is to establish inspection and maintenance procedures to be implemented for erosion and sediment control best management practices (BMP's) during construction, as well as for post-construction stormwater BMP's, for the Tidewater Village TV3. This plan has been prepared in conformance with the requirements set forth in 06-096 Chapter 500 – Stormwater Management, and the Town of Falmouth Post-Construction Stormwater Management Ordinance

1.1 PROJECT DESCRIPTION

Empire Development LLC is proposing to construct a mixed use commercial and residential development on a 3.10 acre parcel located off of Clearwater Drive in Falmouth (Map U52, Lot 6).

The scope of work includes but is not limited to:

- Construction of a paved access drive and parking areas
- Construction of a multi-unit residential building off Clearwater Drive
- Construction of two Underdrained Soil Filters

1.2 REQUIRED PERMITS

The following is a list of Municipal, State, and Federal permits that are required for the Project:

Municipal
Town of Falmouth Site Plan Permit

State of Maine
Maine DEP Stormwater Permit
Maine DEP NRPA Tier 1 Permit

Federal
Army Corps Maine General Permit

1.3 REFERENCES

This plan has been developed in accordance with the following:

- Stormwater Management Law 38 M.R.S. §420-C and §420-D
  http://legislature.maine.gov/statutes/38/title38sec420-C.html
  http://legislature.maine.gov/statutes/38/title38sec420-D.html

- 06-096 Chapter 500 – Stormwater Management
  http://www.maine.gov/sos/cec/rules/06/096/096c500.docx

- General Permit – Construction Activity
  Maine Pollutant Discharge Elimination System (MPDES)
  https://www.maine.gov/dep/land/stormwater/construction.html

- Maine Erosion and Sediment Control Best Management Practices (BMPs)
  Manual for Designers and Engineers
  https://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_engineers.pdf

- Maine Erosion and Sediment Control Practices Field Guide for Contractors
  https://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_field.pdf

- MaineDOT Best Management Practices for Erosion and Sedimentation Control
  https://www.maine.gov/mdot/env/documents/bmp/BMP2008full.pdf

1.4 RESPONSIBLE PARTIES

Preparer/Design Engineer:

Chris MacDonald, PE
BH2M
380B Main Street
Gorham, ME 04038
(207) 839-2771

Developer/Applicant:

Empire Development, LLC
367 U.S. Route One
Falmouth, Maine 04105

Site Contractor:

_____
_____
_____
_____

Owner:

Empire Development, LLC
367 U.S. Route One
Falmouth, Maine 04105

Post Construction Stormwater Inspector:

Chris MacDonald, PE
BH2M
380B Main Street
Gorham, ME 04038
(207) 839-2771

Stormwater Maintenance:

During Construction:

Empire Development, LLC
367 U.S. Route One
Falmouth, Maine 04105

Post Construction:

_____
_____
_____

During construction, the Developer/Applicant or their representatives will be responsible for implementing the erosion and sediment control BMP's as well routine inspections and maintenance of the BMP's.

Post-construction stormwater BMP inspection, maintenance, reporting, and required recertifications will be the responsibility of the Owner or their representatives.

1.5 INSPECTION AND MAINTENANCE – DURING CONSTRUCTION

Anyone who conducts or directs an activity that involves exposing, filling or displacing soil or other earthen materials should take appropriate measures to prevent erosion and the loss of sediment beyond the project site or into a sensitive resource. Erosion and sediment control measures should be in place before the activity begins and should remain functional until the site is permanently stabilized. All measures should remain effective until all areas are permanently stabilized. Any disturbed area should be regularly inspected until the site is fully stabilized with either 90% grass cover or a permanent impervious surface such as pavement. A person who has the knowledge of erosion and sediment control measures and of stormwater management practices should inspect the site at a minimum once a week, and before and after a storm event. Any failing measure should be repaired or modified to adequately stabilize the site prior to the next storm event or no later than 7 calendar days. The inspection frequency table found in Appendix D shall be used as a guide for inspecting each specific BMP. The inspection form found in Appendix B shall be used to record the inspection, its outcome, and the required maintenance.

Refer to the Plans found in Appendix A for additional erosion and sediment control details and narratives.

General Inspection, Maintenance, and Documentation Requirements

1. Inspection and corrective action: Inspect disturbed and impervious areas, erosion control measures, and material storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.

2. Maintenance: If BMP's need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event. All measures must be maintained in effective operating condition until areas are permanently stabilized.

3. Documentation: Maintain a binder with construction inspection forms summarizing the inspections and any corrective action taken. The forms must include the name and qualifications of the person making the inspections, the date of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicle access points to the parcel. Refer to Appendix B for the construction inspection form. Major observations must include BMP's that need maintenance, BMP's that failed to

operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the inspection form what corrective action taken and when it was taken. The Owner shall retain a copy of the inspection forms for a period of at least five years from the completion of permanent stabilization.

Site-Specific BMP's

Refer to Appendix D for inspection and maintenance requirements and frequencies of site-specific BMP's. Refer to the Plans found in Appendix A for narratives and details of the site-specific BMP's. The following is a list of the site-specific BMP's that will require routine inspection and maintenance:

- Sedimentation Barriers (Silt Fence or Erosions Control Mix Berm)
- Stabilized Construction Entrance
- Construction Limit Barrier Fence
- Stone Check Dam
- Temporary Sediment Trap
- Temporary Grass/Stone Lined Swale
- Roadways
- Snow Storage Areas
- Drain Manholes
- Sediment Forebays
- Pipe Outlets
- Grassed Underdrained Soil Filter
- Focalpoint Biofiltration Systems

Winter Construction

Winter construction is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions.

1. Site Stabilization: For winter stabilization, hay mulch is applied at twice the standard temporary stabilization rate. At the end of each construction day, areas that have been brought to final grade must be stabilized. Mulch may not be spread on top of snow.

2. Sediment Barriers: All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers.

3. Ditches: All vegetated ditch lines that have not been stabilized by November 1, or will be worked during the winter construction period, must be stabilized with an

appropriate stone lining backed by an appropriate gravel bed or geotextile unless specifically released from this standard by Maine DEP.

4. Slopes: Mulch netting must be used to anchor mulch on all slopes greater than 8% unless erosion control blankets or erosion control mix is being used on these slopes.

Refer to the Plans contained in Appendix A for additional winter construction erosion and sediment control requirements.

1.6 INSPECTION AND MAINTENANCE – POST-CONSTRUCTION

The long-term operation and maintenance of a stormwater management system is as critical to its performance as its design and construction. Proper operation and maintenance practices ensure that stormwater BMP's continue to improve water quality by removing pollutants effectively over the long-term and decreasing the risk of re-suspending sediment. Without proper maintenance, BMPs are likely to fail and will no longer provide treatment of stormwater. The following includes a summary of the inspection, maintenance, and documentation requirements for post-construction stormwater BMP's.

Refer to the Plans contained in Appendix A for details and locations of site-specific post-construction BMP's.

General Inspection, Maintenance, and Documentation Requirements

1. Inspection and maintenance: All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site.

    a) Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after significant rainfall events (1 inch in 24-hour period) to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

    b) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after significant rainfall events (1 inch in 24-hour period) to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If

the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side slopes.

c) Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.

d) Inspect catch basins and drain manholes annually and clean out either when the sump is half full or when sediment is within one foot of the invert of the outlet pipe. Clean-out must include the removal and legal disposal of any accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins. If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil- absorptive pads).

e) Inspect at least once per year, each underdrained soil filter, including the filter embankments, vegetation, underdrain piping, and overflow spillway. Remove and dispose of accumulated sediments in the filter. If needed, rehabilitate any clogged surface linings, and flush underdrain piping.

2. Regular maintenance

    1. Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.

3. Documentation: Maintain a binder of inspection forms summarizing inspection, maintenance, and any corrective actions taken. The inspection forms must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. Refer to Appendix C for inspection forms. If a maintenance task requires the clean-out of any sediments or debris,

indicate where the sediment and debris was disposed of after removal. The log must be made accessible to Department staff and a copy provided to the Department upon request. The Owner shall retain a copy of the logs for a period of at least five years from the completion of permanent stabilization.

4. The site-specific post-construction BMP's include the following:

   - Vegetated swales
   - Roadways and shoulders
   - Storm Drain System
   - Snow storage areas
   - Rip rap inlet and outlet aprons
   - Sediment forebay
   - Pipe outlets
   - Grassed Underdrained Soil Filter
   - Focalpoint Biofiltration Systems

1.7 RECERTIFICATION OF STORMWATER MANAGEMENT SYSTEMS

All projects permitted under Stormwater Management Law since 2005 require reporting every 5 years. Certification must be sent to the Department of Environmental Protection within three months of the expiration of each five-year interval from the date of issuance of the permit stating that the stormwater management system has been inspected, maintained, and repaired (if needed). Refer to Condition # of the Stormwater Management Law Permit Order contained in Appendix G. The standard form for "Five-Year Recertification for Long-Term Maintenance of Stormwater Management Systems" is contained in Appendix E. The general inspection and maintenance requirements include but are not limited to the following:

The general inspection and maintenance requirements include but are not limited to the following:

1. Identification and repair of erosion problems: All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.

2. Inspection and repair of stormwater control system: All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.

3. Maintenance: The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the Department, and the maintenance log is being maintained.

Note: Municipalities with separate storm sewer systems regulated under the Maine Pollutant Discharge Elimination System (MPDES) Program may report on all regulated systems under their control as part of their required annual reporting in lieu of separate certification of each system. Municipalities not regulated by the

MPDES Program, but that are responsible for maintenance of permitted stormwater systems, may report on multiple stormwater systems in one report.

1.8 HOUSEKEEPING

The following performance standards shall apply:

1. Spill prevention: Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop and implement as necessary appropriate spill prevention, containment, and response planning measures.

NOTE: Any spill or release of toxic or hazardous substances must be reported to the Department. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department's website at : http://www.maine.gov/dep/spills/emergspillresp/

2. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.

   See 06-096 Chapter 500 - Appendix D for license by rule standards for infiltration of stormwater.

NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

3. Fugitive sediment and dust: Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately, 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: Take care in sourcing water. Dewatering a stream without a permit from the Department may violate state water quality standards and the *Natural Resources Protection Act*.

4. Debris and other materials: Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

NOTE: To prevent these materials from becoming a source of pollutants, construction and post- construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. Excavation de-watering: Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.

NOTE: Dewatering controls are discussed in the "Maine Erosion and Sediment Control BMPs, Maine Department of Environmental Protection."

6. Authorized Non-stormwater discharges: Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non- stormwater component(s) of the discharge. Authorized non-stormwater discharges are:

a) Discharges from firefighting activity;
b) Fire hydrant flushings;
c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
d) Dust control runoff in accordance with permit conditions;
e) Routine external building washdown, not including surface paint removal, that does not involve detergents;
f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
g) Uncontaminated air conditioning or compressor condensate;
h) Uncontaminated groundwater or spring water;
i) Foundation or footer drain-water where flows are not contaminated;
j) Uncontaminated excavation dewatering;
k) Potable water sources including waterline flushings; and
l) Landscape irrigation.

7. Unauthorized non-stormwater discharges: The Department's approval under this Chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with 06-096 Chapter 500 - Appendix C (6). Specifically, the Department's approval does not authorize discharges of the following:

    a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
    b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
    c) Soaps, solvents, or detergents used in vehicle and equipment washing; and

    d) Toxic or hazardous substances from a spill or other release.

8. Additional requirements: Additional requirements may be applied on a site-specific basis.

Appendix A
Plans

Appendix B
Construction Inspection Forms

CONSTRUCTION INSPECTION FORM FOR EROSION AND SEDIMENT CONTROL					
General Information:					
Site Name:	Date:		Inspected by:		
Owner:					
Retained 3PI:	Last Rain Date:			Amount:	
Reason for Inspection:	Weekly	Winter	Final	Rain Event	Complaint
Description of disturbed area:					
Photos:					

	YES/NO/NA	COMMENTS
1. Is an Erosion and Sediment Control Plan available?		
ESC plan on-site and followed		
Other:		
2. Are all erosion control practices installed properly, maintained and functioning?		
Disturbed areas stable		
Concentrated flow inlet/outlet protection		
All areas at final grade		
Disturbed dormant areas stabilized		
Access roads and parking		
Hillsides and stockpiles		
Other:		
3. Are all sedimentation control practices installed properly, maintained and functioning?		
Construction entrance		
Sedimentation basins/traps/diversions		
Perimeter controls		
Check dams		
Other:		
4. Is maintenance of ESC measures, construction activities and housekeeping kept-up?		
Sedimentation/erosion in ditches		
Tracked Sediment or dust at exits		
Hazardous material storage and spill control practices		
Waste management (concrete, hazardous material, etc.)		
Other:		
5. Violation, Corrective Actions, Recommendations		
Sediment discharged from site?		
Corrective action required?		
Site compliant with all permits?		
Notice of violation or stop work order issued?		
Comments/Corrective Actions (complete corrective actions before the next rain event and within 7 day)		

Appendix C
Post-Construction Inspection Forms

Tidewater Village TV3 **Post-Construction Inspection Form (Roadway and Parking Areas)**					
Project name:	Date:		Inspected by:		
Owner name:					
Last rain date:	Amount:				
Reason for inspection:	Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					

Inspection Details	**Comments**	**Maintenance Required**
Winter sand accumulation apparent?		
Pavement Sweeping required?		
Gravel shoulders graded appropriately?		
Gravel road grading required?		
Low spots causing puddling?		

Additional Comments:

Tidewater Village TV3 **Post-Construction Inspection Form (Vegetated Area)**					
Project name:	Date:		Inspected by:		
Owner name:					
Last rain date:	Amount:				
Reason for inspection:	Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					

Inspection Details	**Comments**	**Maintenance Required**
All slopes and embankments well vegetated? Signs of sparse growth?		
Rill erosion apparent in vegetated areas?		
Downs slope of level spreaders/ditch turnouts stable?		
Mowing of vegetated areas appropriate?		

Additional Comments:

Tidewater Village TV3 **Post-Construction Inspection Form (Storm Drain System including catch basins and culverts)**					
Project name:	Date:		Inspected by:		
Owner name:					
Last rain date:	Amount:				
Reason for inspection:	Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					

Inspection Details	**Comments**	**Maintenance Required**
Accumulated debris or sediment at inlet, outlet, or within culvert/storm drain?		
Flow obstructions present?		
Erosion apparent at culvert inlet/outlet?		
Accumulated debris around catch basin grate?		
Accumulated debris in catch basin sump?		
Floating debris or oils found in catch basins?		

Additional Comments:

Tidewater Village TV3 **Post-Construction Inspection Form (Underdrain Filter)**					
Project name:	Date:		Inspected by:		
Owner name:					
Last rain date:	Amount:				
Reason for inspection:	Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					

Inspection Details	**Comments**	**Maintenance Required**
Debris apparent in basin bottom?		
Vegetation established in basin bottom?		
Basin draining within 72 hours?		
Inlet forebay rip rap stable and free of debris?		
Embankment and side slopes stable? Sloughs or unvegetated areas apparent?		
Outlet free of debris? Rip rap stable?		
Valve in operating condition?		
Outlet control structure operational free of debris?		
Orifice free of debris and operational?		

Additional Comments:

Montshire Parking Expansion **Post-Construction Inspection Form (Focalpoint; refer to Appendix D for additional Information)**					
Project name:	Date:		Inspected by:		
Owner name:					
Last rain date:	Amount:		Depth of Water in Filter:		
Reason for inspection:	Rain Event	Monthly	Annually	Maint. Performed	Other (Specify)
General description of BMP condition/recent maintenance performed:					
Photos: (Attach)					

Inspection Details	**Comments**	**Maintenance Required**
Inlets, culverts, and surface of Focalpoint free of debris and siltation?		
Signs of settlement or sinkholes in surface of Focalpoint media? Evenly distrusted 3" mulch layer?		
Heathy well established plans on surface of Focalpoint media?		
Inspect subsurface storage system via observation / maintenance port for signs of siltation. Drained within 24 to 48 hours?		
Grassed slopes intact with well established grass, showing no erosion, and appropriately mowed?		
Outlet control structure free of debris, clogging and sediment accumulation?		
Date of last maintenance call by contracted approved stormwater maintenance provider?		

Additional Comments:

Appendix D

Inspection Frequency Checklist and Long-Term Inspection & Maintenance Plan

EROSION AND SEDIMENT CONTROL MEASURES AND ACTIVITY	INSPECTION FREQUENCY		
	Weekly	Before and After a Storm	After Construction
SEDIMENT BARRIERS			
Sediment barriers are installed prior to soil disturbances	X	X	
Silt fences are keyed in and tight	X	X	
Barriers are repaired and replaced as necessary	X	X	
Barriers are removed when the site is stabilized - Silt fence should be cut at the ground surface			X
TEMPORARY STABILIZATION			
Areas are stabilized if idle for 14 days or more	X	X	
Daily stabilization within 100 ft of a natural resource	X	X	
MULCH			
Seed and mulch within 7 days of final grading. Ground is not visible	X	X	
Erosion control mix is 4-6 inch thick	X	X	
Erosion control blankets or hay mulch are anchored	X	X	
VEGETATION			
Vegetation provides 90% soil cover	X		X
Loam or soil amendment were provided	X		X
New seeded areas are mulched and protected from vehicle, foot traffic and runoff	X	X	X
Areas that will remain unworked for more than 1 year are vegetated with grass	X		
SLOPES AND EMBANKMENTS			
Final graded slopes and embankments are stabilized	X	X	X
Diversions are provided for areas with rill erosion	X	X	X
Areas steeper than 2:1 are riprapped	X		
Stones are angular, durable and various in size	X		
Riprap is underlain with a gravel layer or filter fabric	X		
STORMWATER CHANNELS AND CULVERTS			
Ditches and swales are permanently stabilized–channels that will be riprapped have been over-excavated	X	X	X
Ditches are clear of obstructions, accumulated sediments or debris	X	X	X
Ditch lining/bottoms are free of erosion	X	X	X
Check dams are spaced correctly to slow flow velocity	X		
Underlying filter fabric or gravel is not visible	X	X	X
Culvert aprons and plunge pools are sized for expected flows volume and velocity	X		
Stones are angular, durable and various in size	X		
Culverts are sized to avoid upgradient flooding	X	X	
Culvert protection extends to the maximum flow elevation within the ditch	X	X	X
Culvert is embedded, not hanging	X	X	X

CATCH BASIN SYSTEMS			
Catch basins are built properly	X		
Accumulated sediments and debris are removed from sump, grate and collection area		X	X
Floating debris and floating oils are removed from trap			X
ROADWAYS AND PARKING SURFACES			
The gravel pad at the construction entrance is clear from sediments	X	X	
Roads are crowned		X	X
Cross drainage (culvert) is provided	X		
False ditches (from winter sand) are graded		X	X
BUFFERS			
Buffers are free of erosion or concentrated flows		X	X
The downgradient of spreaders and turnouts is stable		X	X
Level spreaders are on the contour			X
The number of spreaders and ditch turnouts is adequate for flow distribution		X	X
Any sediment accumulation is removed from within spreader or turnouts		X	X
STORMWATER BASINS AND TRAPS			
Embankments are free of settlement, slope erosion, internal piping, and downstream swamping		X	X
All flow control structure or orifices are operational and clear of debris or sediments		X	X
Any pre-treatment structure that collects sediment or hydrocarbons is clean or maintained		X	X
Vegetated filters and infiltration basins have adequate grass growth			X
Any impoundment or forebay is free of sediment		X	X
WINTER CONSTRUCTION (November 1st-April15th)			
Final graded areas are mulched daily at twice the normal rate with hay, and anchor (not on snow)	Daily		
A double row of sediment barrier is provided for all areas within 100 ft of a sensitive resource (use erosion control mix on frozen ground)	Daily		
Newly constructed ditches are riprapped	Daily		
Slopes greater than 8% are covered with an erosion control blanket or a 4-inch layer of erosion control mix	Daily		
HOUSEKEEPING PUNCH LIST			
All disturbed areas are permanently stabilized, and plantings are established (grass seeds have germinated with 90% vegetative cover)			X
All trash, sediments, debris or any solid waste have been removed from stormwater channels, catch basins, detention structures, discharge points, etc.			X
All ESC devices have been removed: (silt fence and posts, diversions and sediment structures, etc.)			X
All deliverables (certifications, survey information, as-built plans, reports, notice of termination (NOT), etc.) in accordance with all permit requirements have been submitted to town, Maine DEP, association, owner, etc.			X

INSPECTION AND MAINTENANCE PLAN FOR STORMWATER MANAGEMENT STRUCTURES (BMPS)

	INSPECTION SCHEDULE	CORRECTIVE ACTIONS
VEGETATED AREAS	Annually early spring and after heavy rains	Inspect all slopes and embankments and replant areas of bare soil or with sparse growth
		Armor rill erosion areas with riprap or divert the runoff to a stable area
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Mow vegetation as specified for the area
DITCHES, SWALES AND OPEN STORMWATER CHANNELS	Annually spring and late fall and after heavy rains	Remove obstructions, sediments or debris from ditches, swales and other open channels
		Repair any erosion of the ditch lining
		Mow vegetated ditches
		Remove woody vegetation growing through riprap
		Repair any slumping side slopes
		Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodge
CULVERTS	Spring and late fall and after heavy rains	Remove accumulated sediments and debris at the inlet, outlet, or within the conduit
		Remove any obstruction to flow
		Repair any erosion damage at the culvert's inlet and outlet
CATCH BASINS	Annually in the spring	Remove sediments and debris from the bottom of the basin and inlet grates
		Remove floating debris and oils (using oil absorptive pads) from any trap
ROADWAYS AND PARKING AREAS	Annually in the spring or as needed	Clear and remove accumulated winter sand in parking lots and along roadways
		Sweep pavement to remove sediment
		Grade road shoulders and remove accumulated winter sand
		Grade gravel roads and gravel shoulders
		Clean out the sediment within water bars or open-top culverts
		Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder
RESOURCE AND TREATMENT BUFFERS	Annually in the spring	Inspect buffers for evidence of erosion, concentrated flow, or encroachment by development
		Manage the buffer's vegetation with the requirements in any deed restrictions
		Repair any sign of erosion within a buffer
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Install more level spreaders, or ditch turn-outs if needed for a better distribution of flow
		Clean out any accumulation of sediment within the spreader bays or turnout pools
		Mow non-wooded buffers no shorter than six inches and less than three times per year
WETPONDS AND DETENTION BASINS	Annually in fall and after heavy rains	Inspect the embankments for settlement, slope erosion, piping, and slumping
		Mow the embankment to control woody vegetation
		Inspect the outlet structure for broken seals, obstructed orifices, and plugged trash racks
		Remove and dispose of sediments and debris within the control structure
		Repair any damage to trash racks or debris guards
		Replace any dislodged stone in riprap spillways
		Remove and dispose of accumulated sediments within the impoundment and forebay
FILTRATION AND INFILTRATION BASINS	Annually in the spring and late fall	Clean the basin of debris, sediment and hydrocarbons
		Provide for the removal and disposal of accumulated sediments within the basin
		Renew the basin media if it fails to drain within 72 hours after a one inch rainfall event
		Till, seed and mulch the basin if vegetation is sparse
		Repair riprap where underlying filter fabric or gravel is showing or where stones have dislodged
PROPRIETARY DEVICES	As specified by manufacturer	Contract with a third-party for inspection and maintenance
		Follow the manufacturer's plan for cleaning of devices
OTHER PRACTICES	As specified for devices	Contact the department for appropriate inspection and maintenance requirements for other drainage control and runoff treatment measures.

Appendix E

Post Construction – Maintenance of Stormwater Management Systems

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Land Resources
17 State House Station
Augusta, Maine 04333

FIVE-YEAR RECERTIFICATION FOR LONG-TERM MAINTENANCE OF STORMWATER MANAGEMENT SYSTEMS

For Site Location & Stormwater Projects

This form complies with the condition that requires reporting every 5 years on the long-term maintenance of stormwater management structures of projects permitted under the Stormwater Management Law since 2005. Complete the following sections, include inspection photos, and use additional paper if needed. A copy of the report if the inspection was performed by a professional experienced in BMP maintenance should be included. Electronic copy of this form and information about the five-year recertication are available on the Maine DEP website at: http://www.maine.gov/dep/land/stormwater/stormwaterbmps/

Please type or print in black ink only

Owner/Licensee		**3rd Party Inspection Company** (if applicable)	
Name of Representative:		**Name of Inspector or preparer of report:**	
Company:		**Company:**	
Mailing Address:		**Mailing Address:**	
Daytime Phone #:		**Daytime Phone #:**	
E-mail Address:		**E-mail Address:**	

LOCATION OF DEVELOPMENT			
Name of Project:			
Address and Town:			
DEP Permit Number:		**Year of Permit:**	

PROJECT SPECIFICS	
If the project is unfinished, please describe its current status and your plans for the future. The filing of this report of on-site long-term maintenance activities is still required.	
If the project is within a MPDES Regulated Town, the maintenance report prepared for the town should be submitted with this form.	
If the project is a subdivision with a Homeowner's association, identify the responsible party.	
Confirm that the required recording of deed restrictions for the protection of buffers or conservation land has been done, and that the buffers are maintained according to the restrictions.	
Identify the contractor for the required renewal of a 5-year maintenance contract for the inspection, cleaning and maintenance of manufactured proprietary structures.	
Is a maintenance log available for review?	

LONG-TERM MAINTENANCE (please comment on the following):
All areas of the development have been inspected for erosion, and appropriate steps have been taken to permanently stabilize these areas.
All stormwater control structures have been inspected for damage, wear, malfunction, and appropriate steps have been taken to repair or replace the failing systems.
The erosion control and stormwater maintenance plan for the site is being implemented as written, and a maintenance log has been created and is being maintained.

CERTIFICATIONS/SIGNATURES
By signing below. the owner (or authorized agent) certifies that all stormwater management structures at the project described above are stable and operational as designed.
Signed:_____ **Title**_____**Date:**_____
This completed form and all supporting documents summarized above shall be sent to the following address. An emailed report is appropriate and should be sent to Recert-DEP@maine.gov Five-year Recertification Bureau of Land Resources 17 State House Station Augusta, ME 04333 Tel: (207) 287-2624 or (207) 287-2602

Appendix F

Focal Point Operation and Maintenance



FocalPoint

BIOFILTRATION SYSTEMS

HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM (HPMBS)

Operations & Maintenance

ACF ENVIRONMENTAL

Customer Focused, Environmentally Committed



GENERAL DESCRIPTION

The following general specifications describe the general operations and maintenance requirements for the FocalPoint® High Performance Modular Biofiltration System (HPMBS). The system utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system is a fully equipped, modular, constructed in place system designed to treat contaminated runoff.

Stormwater enters the FocalPoint® HPMBS, is filtered by the High Flow Biofiltration Media and passes through to the underdrain/storage system where the treated water is detained, retained or infiltrated to sub-soils, prior to discharge to the storm sewer system of any remaining flow.

Higher flows bypass the FocalPoint® HPMBS via a downstream inlet or other overflow conveyance. Maintenance is a simple, inexpensive and safe operation that does not require confined space entry, pumping or vacuum equipment, or specialized tools. Properly trained landscape personnel can effectively maintain FocalPoint® HPMBS by following instructions in this manual.

BASIC OPERATIONS

FocalPoint® is a modular, high performance biofiltration system that often works in tandem with other integrated management practices (IMP). Contaminated stormwater runoff enters the biofiltration bed through a conveyance swale, planter box, or directly through a curb cut or false inlet. Energy is dissipated by a rock or vegetative dissipation device and is absorbed by a 3-inch layer of aged, double shredded hardwood mulch, with fines removed, (when specified) on the surface of the biofiltration media.

As the water passes through the mulch layer, most of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water passes through the biofiltration media where the finer particles are removed and numerous chemical reactions take place to immobilize and capture pollutants in the soil media.

The cleansed water passes into the underdrain/storage system and remaining flows are directed to a storm sewer system or other appropriate discharge point. Once the pollutants are in the soil, bacteria begin to break down and metabolize the materials and the plants begin to uptake and metabolize the pollutants. Some pollutants such as heavy metals, which are chemically bound to organic particles in the mulch, are released over time as the organic matter decomposes to release the metals to the feeder roots of the plants and the cells of the bacteria in the soil where they remain and are recycled. Other pollutants such as phosphorus are chemically bound to the soil particles and released slowly back to the plants and bacteria and used in their metabolic processes. Nitrogen goes through a variety of very complex biochemical processes where it can ultimately end up in the plant/bacteria biomass, turned to nitrogen gas or dissolves back into the water column as nitrates depending on soil temperature, pH and the availability of oxygen. The pollutants ultimately are retained in the mulch, soil and biomass with some passing out of the system into the air or back into the water.

DESIGN AND INSTALLATION

Each project presents different scopes for the use of FocalPoint® HPMBS. To ensure the safe and specified function of this stormwater BMP, Convergent Water Technologies and/or its Value Added Resellers (VAR) review each application before supply. Information and design assistance is available to the design engineer during the planning process. Correct FocalPoint® sizing is essential to optimum performance. The engineer shall submit calculations for approval by the local jurisdiction when required. The contractor and/or VAR is responsible for the correct installation of FocalPoint® HPMBS units as described in approved plans. A comprehensive installation manual is available at www.convergentwater.com.



FocalPoint
BIOFILTRATION SYSTEMS

MAINTENANCE

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement. Other reasons for maintenance include:

- Avoid legal challenges from your jurisdiction's maintenance enforcement program.
- Prolong the lifespan of your FocalPoint® HPMBS.
- Avoid costly repairs.
- Help reduce pollutant loads leaving your property.

Simple maintenance of the FocalPoint® HPMBS is required to continue effective pollutant removal from stormwater runoff before any discharge into downstream waters. This procedure will also extend the longevity of the living biofiltration system. The unit will recycle and accumulate pollutants within the biomass, but may also subjected to other materials entering the surface of the system. This may include trash, silt and leaves etc. which will be contained above the mulch and/or biofiltration media layer. Too much silt may inhibit the FocalPoint's® HPMBS flow rate, which is a primary reason for system maintenance. Removal of accumulated silt/sediment and/or replacement of the mulch layer (when specified), is an important activity that prevents over accumulation of such silt/sediment.

When to Maintain?

Convergent Water Technologies and/or its VAR includes a 1-year maintenance plan with each system purchased. Annual included maintenance consists of two (2) scheduled maintenance visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as when the site is appropriately stabilized, the unit is installed and activated (by VAR), i.e., when mulch (if specified) and plantings are added.

Activation should be avoided until the site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed). Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands. The fall visit helps the system by removing excessive leaf litter.

A first inspection to determine if maintenance is necessary should be performed at least twice annually after storm events of greater than (1) one inch total depth (subject to regional climate). Please refer to the maintenance checklist for specific conditions that indicate if maintenance is necessary.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required. Regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the VAR/Maintenance contractor and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the VAR/Maintenance contractor of any damage to the plant(s), which constitute(s) an integral part of the biofiltration technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance of the FocalPoint® HPMBS to the VAR/Maintenance contractor (i.e. no pruning or fertilizing).

EXCLUSION OF SERVICES

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant(s) in the FocalPoint® HPMBS.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the VAR/Maintenance contractor maintenance contract. Should a major contamination event occur, the Owner must block off the outlet pipe of the FocalPoint® (where the cleaned runoff drains to, such as drop-inlet) and block off the point where water enters of the FocalPoint® HPMBS. The VAR/Maintenance contractor should be informed immediately.

MAINTENANCE VISIT SUMMARY

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of FocalPoint® HPMBS and surrounding area
2. Removal of debris, trash and mulch
3. Mulch replacement
4. Plant health evaluation (including measurements) and pruning or replacement as necessary
5. Clean area around FocalPoint® HPMBS
6. Complete paperwork, including date stamped photos of the tasks listed above.

MAINTENANCE TOOLS, SAFETY EQUIPMENT AND SUPPLIES

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working in close proximity to traffic and also safety hats and shoes.

MAINTENANCE VISIT PROCEDURE

Inspection of FocalPoint® HPMBS and surrounding area

Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

- Standing Water yes | no
- Is Bypass Inlet Clear? yes | no
- Damage to HPMBS System yes | no
- to Overflow conveyance yes | no

Removal of Silt / Sediment / Clay

Dig out silt (if any) and mulch and remove trash & foreign items.

- Silt / Clay Found? yes | no
- Cups / Bags Found? yes | no
- Leaves? yes | no
- Volume of material removed _____ (volume or weight)

Removal of debris, trash and mulch

After removal of mulch and debris, measure distance from the top of the FocalPoint® HPMBS engineered media soil to the flow line elevation of the adjacent overflow conveyance. If this distance is greater than that specified on the plans (typ. 6" - 12"), add media (not top soil or other) to recharge to the distance specified.

- Distance to media surface to flow line of overflow conveyance (inches) _____
- # of Buckets of Media Added _____

Mulch Replacement

Most maintenance visits require only replacement mulch (if utilized) which must be, aged, double shredded hardwood mulch with fines removed. For smaller projects, one cubic foot of mulch will cover four square feet of biofiltration bed, and for larger projects, one cubic yard of mulch will cover 108 square feet of biofiltration bed. Some visits may require additional FocalPoint® HPMBS engineered soil media available from the VAR/Contractor.

- Add double shredded, aged hardwood mulch which has been screened to remove fines, evenly across the entire biofiltration media bed to a depth of 3".
- Clean accumulated sediment from energy dissipation system at the inlet to the FocalPoint® HPMBS to allow for entry of trash during a storm event.

Plant health evaluation and pruning or replacement as necessary

Examine the plant's health and replace if dead or dying.
Prune as necessary to encourage growth in the correct directions

- Height above Grate (feet) _____
- Width at Widest point (feet) _____
- Health alive | dead
- Damage to Plant yes | no

Clean area around FocalPoint® HPMBS

- Clean area around unit and remove all refuse to be disposed of appropriately.

Complete paperwork

- Deliver Maintenance Report and photographs as appropriate.
- Some jurisdictions may require submission of maintenance reports in accordance with approvals.
- It is the responsibility of the Owner to comply with local regulations.

FocalPoint Warranty

Seller warrants goods sold hereunder against defects in materials and workmanship only, for a period of (1) year from date the Seller activates the system into service. Seller makes no other warranties, express or implied.

Seller's liability hereunder shall be conditioned upon the Buyer's installation, maintenance, and service of the goods in strict compliance with the written instructions and specifications provided by the Seller. Any deviation from Seller's instructions and specifications or any abuse or neglect shall void warranties.

In the event of any claim upon Seller's warranty, the burden shall be upon the Buyer to prove strict compliance with all instructions and specifications provided by the Seller.

Seller's liability hereunder shall be limited only to the cost or replacement of the goods. Buyer agrees that Seller shall not be liable for any consequential losses arising from the purchase, installation, and/or use of the goods.

Maintenance Checklist

Element	Problem	What To Check	Should Exist	Action
Inlet	Excessive sediment or trash accumulation	Accumulation of sediment or trash impair free flow of water into FocalPoint	Inlet free of obstructions allowing free flow into FocalPoint System	Sediments or trash should be removed
Mulch Cover	Trash and floatable debris accumulation	Excessive trash or debris accumulation.	Minimal trash or other debris on mulch cover	Trash and debris should be removed and mulch cover raked level. Ensure that bark nugget
Mulch Cover	Ponding of water on mulch cover	Ponding in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils	Stormwater should drain freely and evenly over mulch cover.	Contact VAR for advice.
Plants	Plants not growing, or in poor condition	Soil/mulch too wet, evidence of spill. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact VAR for advice.
Plants	Plant growth excessive	Plants should be appropriate to the species and location of FocalPoint		Trim/prune plants in accordance with typical landscaping and

Appendix G
Stormwater Report Narrative

Appendix H
Permit Order