

**Pineland**

Cumberland Hall
41 Campus Drive, Suite 101
New Gloucester, ME 04260

Portland

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Portland, ME 04101

November 21, 2024

2065.10

Steve Puleo, Planning Director
Town of Windham
Planning Department
8 School Road
Windham, ME 04062

Response to Comments
Major Subdivision – Final Plan Amendment Application
Canada Hill Subdivision

On behalf of Blessed by Four LLC (applicant) Terradyn Consultants, LLC (Terradyn) is pleased to submit responses to comments provided by the Town of Windham in its memorandum dated November 14, 2024 for the Major Subdivision – Final Plan Amendment Application for the Canada Hill Subdivision located off Highland Cliff Road in Windham, Maine.

The Canada Hill Subdivision consists of a 13-lot residential subdivision located northeasterly of the intersection of Canada Hill Road and Highland Cliff Road. The proposed amendment to the Canada Hill Subdivision focuses on completing unbuilt stormwater management features from the 2012 approval, such as berms, level spreaders, and culvert repairs. It also includes modifications to an existing MeDEP underdrained sand filter (UDSF) to prevent overflow onto Highland Cliff Road.

The Town's review comments and our responses in *italics* are provided below:

Planning Department:

- Missing deeds for Lots 1, 2, 3, 8, 10, 11, 12, and 13. Does the applicant have written authorization from the above property owners and the HOA to enter their properties and construction or maintain stormwater BMPs? Please provide for final plan review.

Response: The applicant and its legal representative have developed a draft "Lot Access Agreement Letter" to be executed with lot owners within the Canada Hill Subdivision Homeowners Association (HOA) authorizing the applicant and/or its representatives to enter real property to perform construction and/or maintenance of Phase I stormwater BMPs proposed to be constructed for the Major Subdivision – Final Plan Amendment Application. We note that authorization should only be required to access lots 1, 2, 3, 11, and 12. Executed authorization letters will be included with the Final Plan submission. See a copy of the draft authorization letter included in Attachment 1.

- The cover letter states 15-lots, but the project description references 13-single family lots, please clarify.

Response: The Canada Hill Subdivision includes 13 single-family residential lots under individual ownership and two open space lots currently owned by Chase Custom

Homes & Finance, Inc. (CCHFI). Once the applicant is in receipt of the necessary approvals from the MeDEP and Town of Windham, the applicant intends to transfer ownership of the open space lots, protective convenances, and easements to the Canada Hill Subdivision HOA and the Highland Cliff Road Right-of-Way with grading and drainage easements to the Town of Windham.

- Missing in plan set the recorded exiting subdivision plan.

Response: The Canada Hill Subdivision Plans were recorded in the Cumberland County of Registry of Deeds (CCRD) as Book 215, Page 140 on April 30, 2015. Copies of the three (3) subdivision plans have been added to the plan set included with this submission.

- Missing for the digital transfer of subdivision plan (GIS format). Please provide for final plan review.

Response: Digital transfer of the subdivision plan in GIS format will be included with the Final Plan submission.

- Any waiver requests needed from the Board approval i.e., stormwater treatment in vegetative buffer or anything else.

Response: The applicant is not requesting any waivers at this time.

- Please provide contact person name for the applicant (Blessed by Four, LLC).

Response: The 2012 development project included Blessed by Four, LLC as the applicant and CCHFI as the owner of the project parcel. We note that the applicant and owner are the legal entities that comprise the John F. Chase Trust. Contact information for Ciarra Chase (applicant/owner) has been added to Sheet C-0.0 – Cover Sheet.

- Provide all the preliminary plan information that shows mark ups of the amendments for the Planning Board.

Response: The Final Plan Amendment application includes the completion of a punch list of items identified during a site walk with Town of Windham and MeDEP staff on July 1, 2022 to satisfy the requirements of the 2012 MeDEP Stormwater Permit Order and Town Site Plan approval.

The punch list of items includes the construction of stormwater BMPs that were included on the 2012 Sebago Technics plans but were not constructed and modification to an existing MeDEP UDSF. The punch list of items to be constructed are detailed on the Terradyn plan set and are identified with cloud notations. For comparison purposes, Terradyn has provided cloud notations on the 2012 Sebago Technics plans for the stormwater BMPs that were not constructed. See 2012 Sebago Technics plans included in Attachment 2.

- Please explain if the BMPs and the amount of percentage of treatment in phase II non-linear portion over treatment to accommodate for under the treated areas in phase I

Response: Terradyn met virtually with Dawn Hallowell, MeDEP Licensing Division Director, to discuss the Phase I Stormwater Amendment Application and specifically, the calculations demonstrating that approximately 3,000 SF of additional lot impervious area is required to be treated in Phase I to meet MeDEP General Standards for water quality while approximately 3,000 SF of lot impervious area is being overtreated in Phase II exceeding the General Standard requirement.

The Phase I stormwater amendment application is currently under MeDEP review. Terradyn understands that the Department will issue an amendment to the 2012 Stormwater Order – L-25611-NJ-A-N to bring Phase I into compliance with the construction and/or maintenance of Phase I stormwater BMPs with the condition that Phase II development activities will overtreat 3,000 SF of additional lot impervious area for the General Standards to be met for Phase I.

In addition, the Department will restart its review of the MeDEP Site Location of Development Act (SLODA) application that was submitted on behalf of CCHFI for Phase II of the Canada Hill Subdivision on May 17, 2022. Terradyn understands that the SLODA permit order will reference the Phase I amended permit order and the overtreatment of 3,000 SF of additional lot impervious area for the General Standards to be met for Phase I and Phase II of the Canada Hill Subdivision. We note that this review was placed on hold at the request of the applicant after the death of the applicant/owner.

- In section J. Stormwater Management, please update the recording plan with General Note and the new MeDEP issue the amended stormwater permit order number.

Response: The Canada Hill Subdivision Plan will be updated to include a note referencing the MeDEP Amended Stormwater Permit Order with the Final Plan submission. This plan will be recorded at the CCRD.

- E. (2). Please confirm CCHFI will transfer MeDEP portion of amended stormwater permit to the Canada Hill Homeowner's Association.

Response: Once the applicant is in receipt of the necessary approvals from the MeDEP and Town of Windham, the applicant intends to transfer permit approvals to the Canada Hill Subdivision HOA.

- Please update the FEMA 100yr Floodplain mapping and the net residential density calculations. The Town adopted the new map June 24, 2024.

Response: The plans have been amended to include updated FEMA 100-yr Floodplain mapping associated with Small Brook according to the Federal Insurance Rate Map 23005C0657F. See a copy of the FEMA map included in Attachment 3.

The Town Ordinance Farm District density requirements include 80,000 SF/unit of Net Residential Area. The acreage within the FEMA 100-yr Floodplain was reduced from 9.51 acres to 2.68 acres, wetlands outside the FEMA 100-yr Floodplain increased from 2.81 acres to 3.81 acres, and steep slopes increased from 6.99 acres to 8 acres. Based on the density calculations, there is a potential for 32 units versus the previously calculated 30 units within the 79.07-acre site. The full build-out of the Canada Hill Subdivision will include 27 lots.

Town Engineer:

- There are a couple of notations on the plan set (see example below) where it says “construct”, but then there’s another note saying proposed work (not constructed). Based on some of the other explanations in the application, I think these items were not previously constructed and the Applicant doesn’t intend to construct them as part of the Phase I Plan Amendment or Phase 2 Application. The way it is presented on the plans is confusing and should be clarified.

Response: The plans have been revised to remove notations for “proposed work (not constructed)” for Phase I stormwater BMPs not constructed as part of the 2012 Site Plan approval that will be constructed as part of this project and provided notations for Phase I stormwater BMPs not constructed as part of the 2012 Site Plan approval that will not be constructed as part of this project. These stormwater BMPs that will not be constructed include two (2) diversion berms and three (3) levels lip spreaders that were not constructed prior to Phase I Lots 8, 9, 10, & 11 being sold.

- The proposed plan includes the reconstruction/enlargement of the existing underdrain soil filter in response to heavy rain events which have exceeded the capacity of the as-built UDSF and flooded onto the roadway. The hydraulic analysis performed indicates that the 24-hr, 25-yr peak flows from the proposed redesign of the UDSF will be less than those from the existing, as-built UDSF, and that based on modeled elevations will be released via the broad-crested weir (riprap emergency overflow) rather than onto the road. In order to provide some surety that the UDSF will handle peak stormwater flows without overtopping onto the road even if the 4” underdrain is plugged, the model should be run with zero outflow from the underdrain. Please confirm whether the proposed plan includes installation of new underdrain, filter and drainage media or just slightly enlarging the UDSF? Please also confirm what the as-built elevation of the UDSF berm is adjacent to the Highland Cliff Road.

Response: The proposed UDSF top of berm elevation adjacent to the Highland Cliff Road is proposed to be 203.50 feet versus the as-built condition top of berm of 2.61 feet that was verified by Terradyn professional surveyors.

The UDSF was modeled with an emergency spillway outlet with no underdrain or exfiltration outlets using the HydroCAD computer software program. The evaluation includes the addition of a 2-foot wide by 2-foot-high diversion berm located across the rear of Lots 1, 2, and 3 that diverts upgradient stormwater runoff originating from Canada Hill from being tributary to the UDSF.

The HydroCAD program provides information that the post-development peak rate of runoff is 4.05 CFS for the 25-year frequency, 24-hour duration storm event with a peak elevation of 202.53 feet with the underdrain and exfiltration outlets not operating while the post-development peak rate of runoff is 3.27 CFS for the 25-year frequency, 24-hour duration storm event with a peak elevation of 202.49 feet with the underdrain and exfiltration outlets operating. See UDSF HydroCAD results included in Attachment 4.

Proposed UDSF construction activities will include increasing the storage capacity of the basin and reconfiguring the riprap emergency spillway. We note that Leavitt Construction removed the topsoil, rototilled, and loamed and seeded the filter bed area in the summer of 2022.

- The application acknowledges that the two diversion berms and three level lip spreaders proposed to be constructed at the rear of Lots, 8,9,10 and 11 were not built before these lots were sold, and based on this the percentage of impervious area treated by the wet pond, UDSF or buffers is only 90% compared to the 95% required under Ch. 500 General Standards. The application indicates that 3,000 SF more area needs to be treated to get the percentage up to 95% and that to make up for the deficiency they proposed to treat an extra 3,000 SF of area in their proposed Phase 2. Based on my review of the plans and analyses conducted by the applicant, it's not entirely clear that 3,000 SF is an accurate number to reflect what isn't being treated in Phase 1. It would be helpful if the applicant could provide an overlay map showing what they are assuming as-built impervious area in Phase 1 to confirm that 3,000 SF is an accurate number.

Response: The Phase I Water Quality Treatment Table and Treatment Maps were developed based on the as-built conditions with the addition of the punch list of items to assess the project's General Standards requirements. Water quality treatment was provided for as-built linear and non-linear developed areas tributary to stormwater BMPs that include the wet pond, UDSF, and vegetated buffers. Watersheds tributary to the BMPs are depicted with various colors on the Treatment Map. As-built linear and non-linear developed areas not provided with water quality treatment are depicted with the color blue on the Treatment Map. See Phase I Water Quality Treatment Table, Treatment Map, and Aerial Map included in Attachment 5.

Water quality treatment for the linear portion of the project was calculated based on our review of the Sebago Technics plans and profiles for Highland Cliff Road. Water quality treatment was provided for developed areas tributary to stormwater BMPs that include the wet pond and UDSF.

The Aerial Map was developed with the BMP watersheds overlaid on aerial mapping to show the Phase I as-built developed areas. The as-built lot areas were reviewed to confirm that the Phase I lots generally consist of approximately 20,000 SF of developed area with 15,000 SF of landscaped area and 5,000 SF of impervious area. Water quality treatment was provided for developed areas tributary to stormwater BMPs that include the wet pond, UDSF, and vegetated buffers to confirm that approximately 3,000 SF of additional lot impervious area is required to be treated to meet the General Standards due to the two diversion berms and three levels lip spreaders not being constructed on Phase I Lots 8, 9, 10, & 11, while the General

Standards will be exceeded in Phase II with the overtreatment of lot impervious area by approximately 3,000 SF.

Town Assessor:

- The amended subdivision plan looks fine from my end, except that I am confused by the applicant's reference to map 16 in the third paragraph of their cover letter (sentence 1 of that paragraph). Map 16 is nowhere near this subdivision. All of the parcels referenced appear to be on Map 4.

Response: Map 16 was mistakenly noted. The 2012 development parcel consisted of approximately 79.07 acres shown as lot 9 on the Town of Windham Tax Maps 4. CCHFI retained the 51.0-acre Lot 14, which is shown as lot 9-14 on Tax Map 4.

Attachments:

In addition to the plan set, the following items are attached:

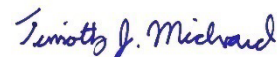
Attachment 1 - Draft Authorization Letter
Attachment 2 – 2012 Sebago Technics Plans with Cloud Notations
Attachment 3 – FEMA Map
Attachment 4 - UDSF HydroCAD Results
Attachment 5 – Water Quality Treatment Table and Treatment Maps

Closure:

We hope these responses to comments will allow the project to be placed on the next available Planning Board Meeting agenda. If you have any questions or require additional information, please contact me at 207-939-5970 or tim@terradyconsultants.com.

Sincerely,

TERRADYN CONSULTANTS, LLC



Tim Michaud
Project Engineer

ATTACHMENT 1

Attachment 1 - Draft Authorization Letter

November __, 2024

To whom it may concern:

The Maine Department of Environmental Protection and the Town of Windham are requiring that certain work be performed on lots 1, 2, 3, 11 and 12 of the subdivision relating to the maintenance of certain buffers and stormwater features necessary for the subdivision (the "**Required Work**").

By signing below, you are authorizing Chase Custom Homes & Finance, Inc. (and/or its representatives) ("**Chase Custom Homes**") to enter onto your real property to perform the Required Work. Any and all work will be performed during regular business hours, unless Chase Custom Homes provides advance notice of work being performed at other times. The authorization provided through this letter shall expire upon the complete of the Required Work.

Please do not hesitate to call with any questions. Please sign below and return. Thank you.

Sincerely,

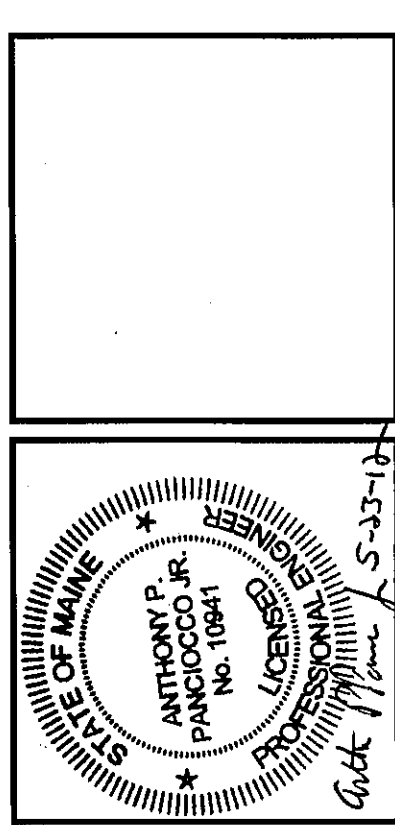
Ciarra Chase, of Chase Custom Homes &
Finance, Inc.

SEEN AND AGREED:

Print Name:

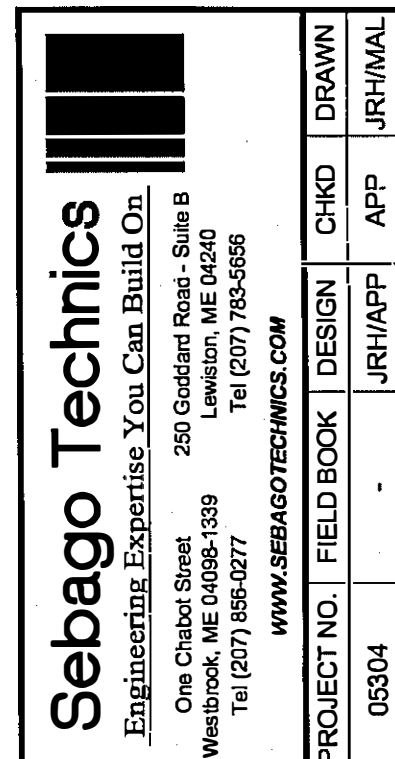
ATTACHMENT 2

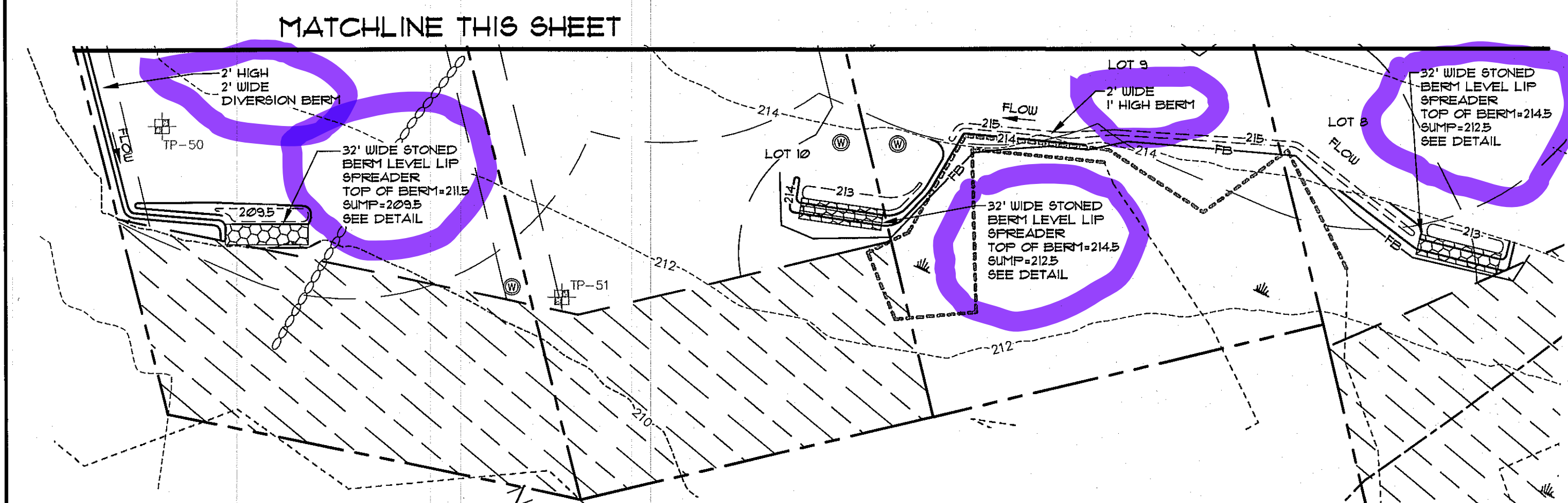
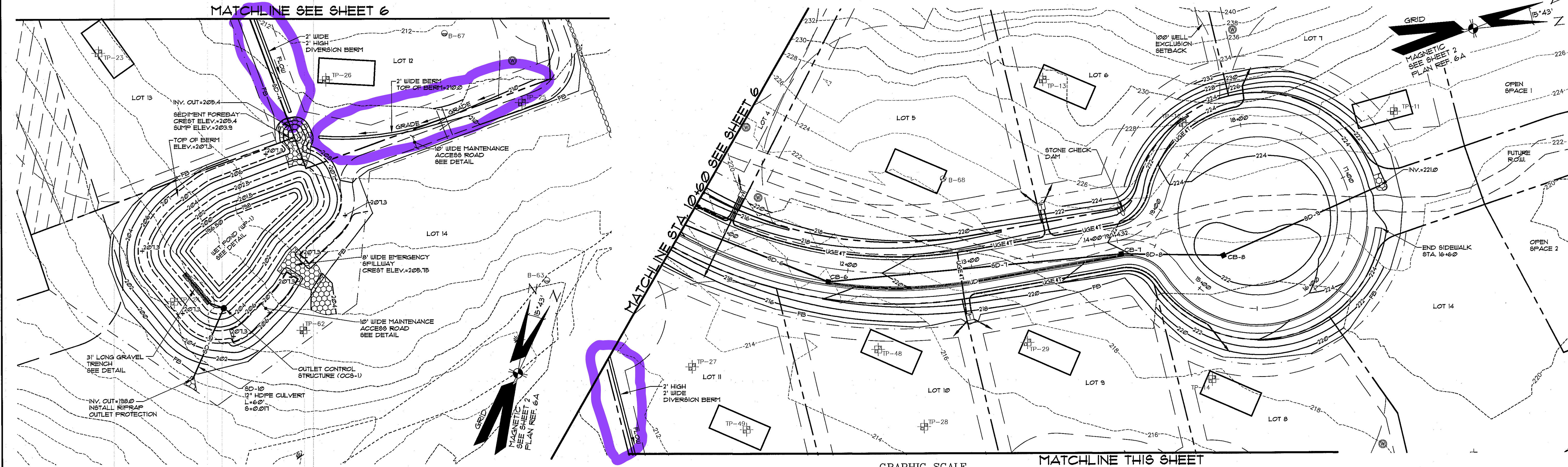
Attachment 2 – 2012 Sebago Technics Plans with Cloud Notations



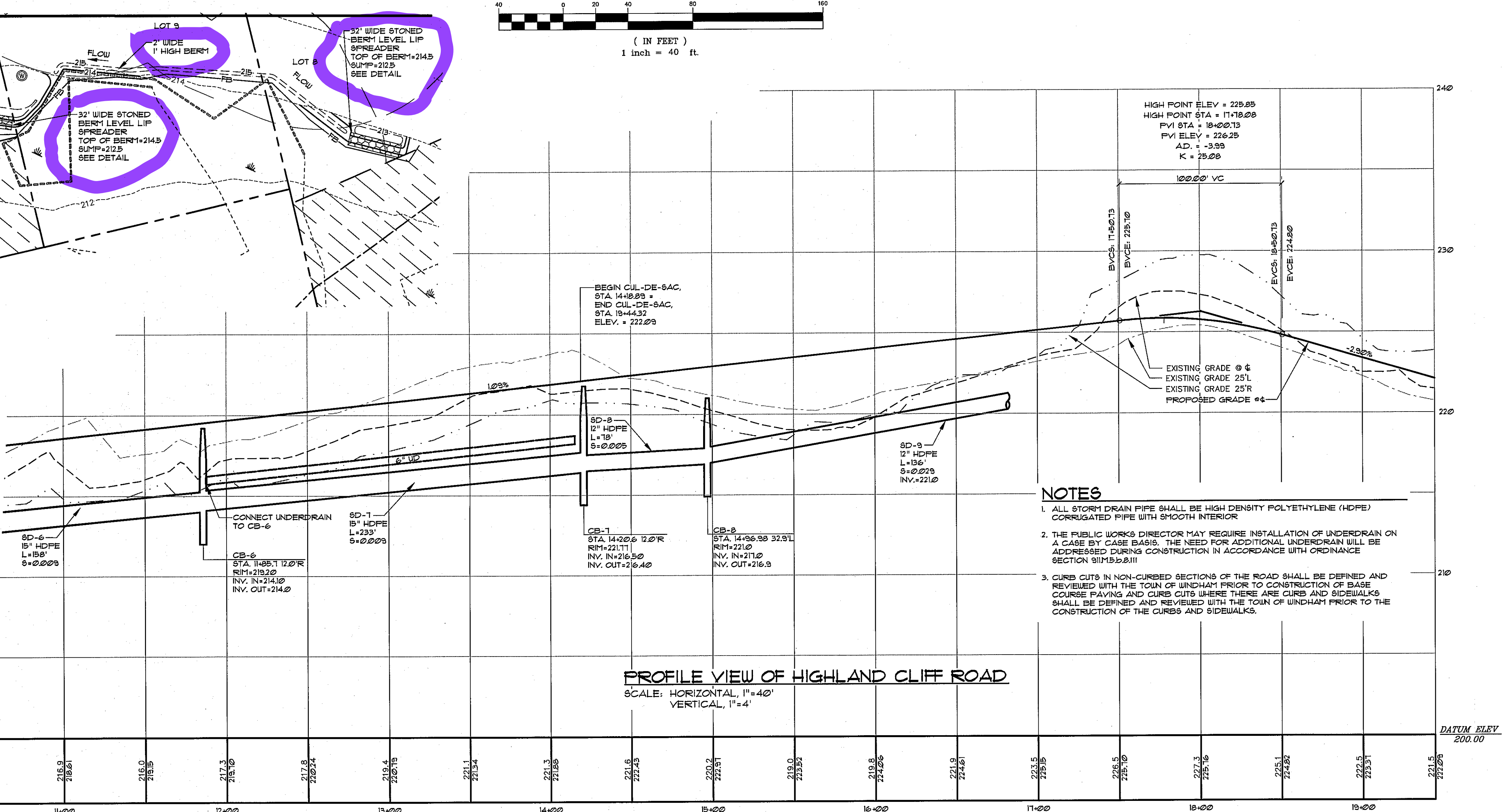
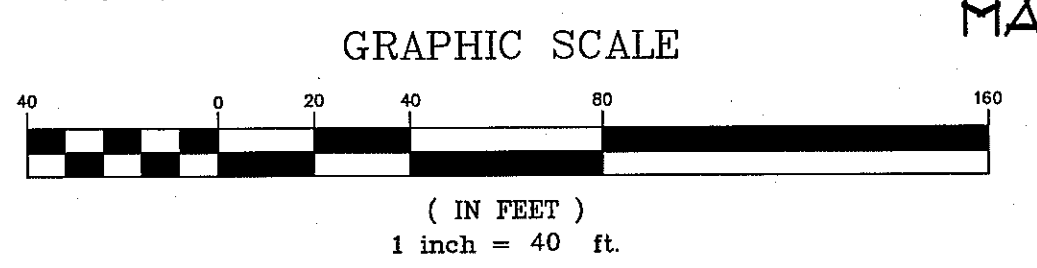
G	APP	05-23-12	SUBMITTED FOR FINAL SUBDIVISION PLAN REVIEW.
F	APP	04-11-12	REVISED PER MDEP REVIEW COMMENTS
E	APP	04-08-12	REVISED PER MDEP REVIEW COMMENTS
D	APP	02-16-12	SUBMITTED FOR MDEP STORMWATER PERMIT REVIEW
C	APP	01-24-11	REVISED PER PEER REVIEW COMMENTS
B	APP	12-27-11	REVISED PER PEER REVIEW COMMENTS
A	APP	12-6-11	SUBMIT FOR PRELIMINARY SUBDIVISION REVIEW
REV.	BY:	DATE:	STATUS:

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHINCS, INC. ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHINCS, INC.





LEGEND		LEGEND	
EXISTING	DESCRIPTION	PROPOSED	DESCRIPTION
---	BOUNDARY LINE/ROW	---	BOUNDARY LINE/ROW
---	ADJUTER LINE/ROW	---	ADJUTER LINE/ROW
---	SETBACK	---	SETBACK
---	WELL EXCLUSION SETBACK	---	WELL EXCLUSION SETBACK
---	EASEMENT	---	EASEMENT
---	CENTERLINE	---	CENTERLINE
---	MONUMENT	---	MONUMENT
---	IRON PIPE/ROD	---	IRON PIPE/ROD
---	DRILLHOLE	---	DRILLHOLE
---	BUFFER PIN	---	BUFFER PIN
---	DEED CALL	---	DEED CALL
---	CURVE/LINE NO.	---	CURVE/LINE NO.
---	BENCHMARK	---	BENCHMARK
---	TEST PIT	---	TEST PIT
---	BUILDING	---	BUILDING
---	WETLANDS	---	WETLANDS
---	UPLAND	---	UPLAND
---	EDGE WETLAND (GPS)	---	EDGE WETLAND (GPS)
---	EDGE WETLAND (SURVEY)	---	EDGE WETLAND (SURVEY)
---	SIGN	---	SIGN
---	STREAM	---	STREAM
---	ROCK OUTCROP	---	ROCK OUTCROP
---	EDGE PAVEMENT	---	EDGE PAVEMENT
---	PAVEMENT PAINT	---	PAVEMENT PAINT
---	GRAVEL ROAD	---	GRAVEL ROAD
---	CURBLINE	---	CURBLINE
---	TREELINE	---	TREELINE
---	DECIDUOUS TREE	---	DECIDUOUS TREE
---	CONIFEROUS TREE	---	CONIFEROUS TREE
---	GUARDRAIL	---	GUARDRAIL
---	FOTABLE WELL	---	FOTABLE WELL
---	STORM DRAIN	---	STORM DRAIN
---	UNDERDRAIN	---	UNDERDRAIN
---	CATCH BASIN	---	CATCH BASIN
---	DRAINAGE MH	---	DRAINAGE MH
---	CULVERT	---	CULVERT
---	OVERHEAD UTILITY	---	OVERHEAD UTILITY
---	UNDERGROUND UTILITY	---	UNDERGROUND UTILITY
---	TRANSFORMER PAD	---	TRANSFORMER PAD
---	UTILITY POLE	---	UTILITY POLE
---	GUY	---	GUY
---	EC. BLANKET	---	EC. BLANKET
---	FILTER BARRIER	---	FILTER BARRIER
---	RIPRAP	---	RIPRAP
---	CHECK DAM	---	CHECK DAM
---	CONTOURS	---	CONTOURS
---	SPOT GRADE	---	SPOT GRADE
---	WIRE FENCE	---	WIRE FENCE
---	STONE WALL	---	STONE WALL
---	RETAINING WALL	---	RETAINING WALL
---	SEPTIC FIELD WITH NITRATE PLUME	---	SEPTIC FIELD WITH NITRATE PLUME



REV.	DATE	BY	STATUS
05-23-12		APP	SUBMITTED FOR FINAL SUBDIVISION PLAN REVIEW
04-11-12		APP	REVISED PER MDP REVIEW COMMENTS
04-06-12		APP	REVISED PER MDP REVIEW COMMENTS
02-16-12		APP	SUBMITTED FOR MDP REVIEW PERMIT REVIEW
01-24-11		APP	REVISED PER PEER REVIEW COMMENTS
12-27-11		APP	REVISED PER PEER REVIEW COMMENTS
12-6-11		APP	SUBMIT FOR PRELIMINARY SUBDIVISION REVIEW

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Tel (207) 858-0277
Fax (207) 753-5555
WWW.SEBAGOTECHNIQUES.COM

PROJECT NO.	FIELD BOOK	DESIGN	CHKD	DRAWN
05304		JRH/APP	APP	JRH/APP

PLAN & PROFILE - 2
OF:
CANADA HILL SUBDIVISION
CANADA HILL ROAD / HIGHLAND CLIFF ROAD
WINDHAM, MAINE
FOR:
BLESSED BY FOUR, LLC
ONE PERCY HAWKS ROAD
WINDHAM MAINE 04062

DATE	SCALE
11-14-11	AS SHOWN

SHEET 7 OF 13

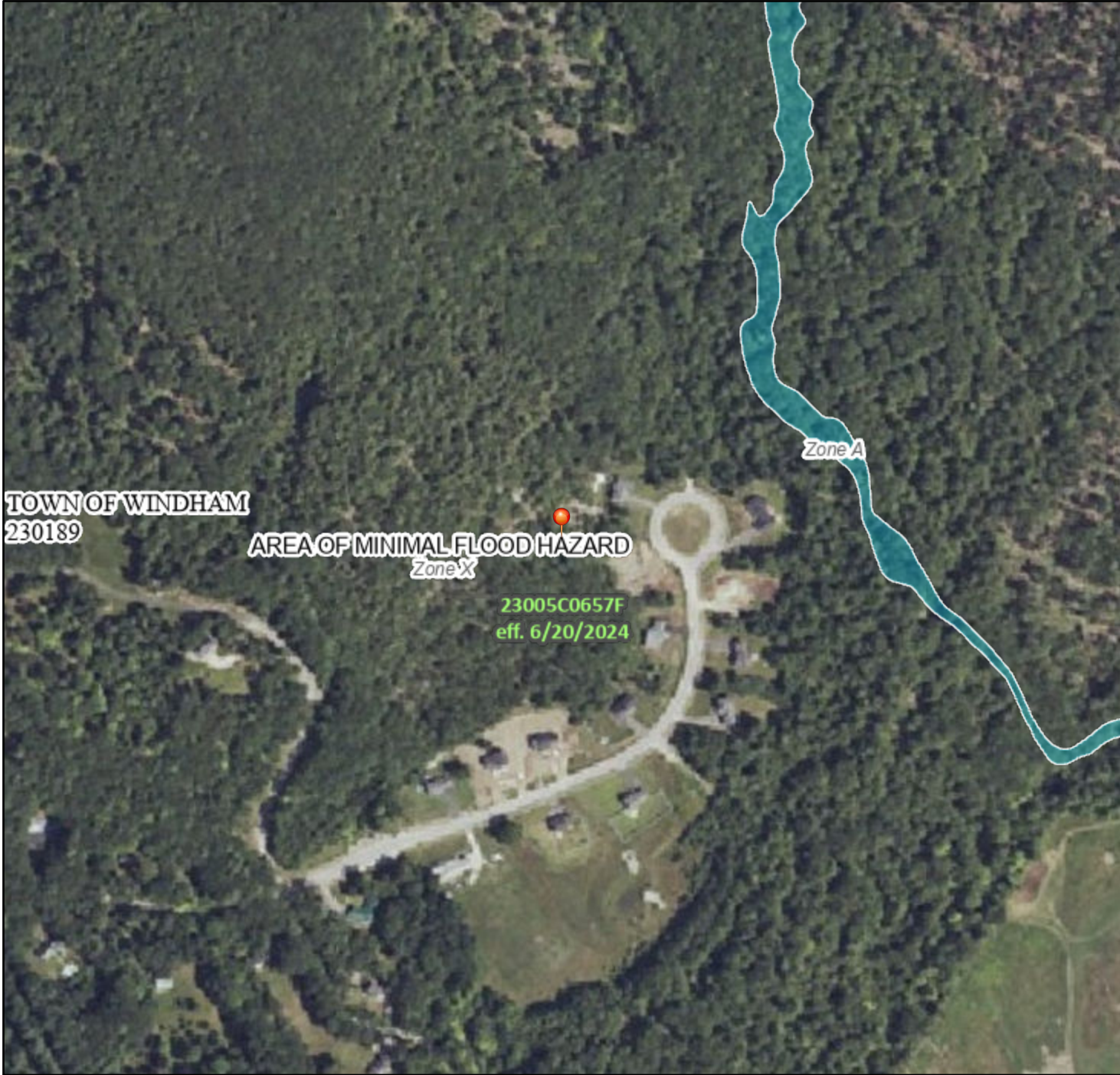
ATTACHMENT 3

Attachment 3 – FEMA Map

National Flood Hazard Layer FIRMMette



70°23'13"W 43°44'21"N



1:6,000

70°22'36"W 43°43'55"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/18/2024 at 8:08 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

ATTACHMENT 4

Attachment 4 - UDSF HydroCAD Results

Post UDSF -Design

Type III 24-hr 25 YEAR Rainfall=5.80"

Prepared by Terradyn Consultants LLC

Printed 11/20/2024

HydroCAD® 10.10-5a s/n 11715 © 2020 HydroCAD Software Solutions LLC

Summary for Pond USDF: Terradyn Proposed

Inflow Area = 1.025 ac, 20.00% Impervious, Inflow Depth > 3.77" for 25 YEAR event
 Inflow = 4.29 cfs @ 12.12 hrs, Volume= 0.322 af
 Outflow = 3.27 cfs @ 12.22 hrs, Volume= 0.282 af, Atten= 24%, Lag= 6.2 min
 Primary = 0.26 cfs @ 12.22 hrs, Volume= 0.185 af
 Secondary = 3.01 cfs @ 12.22 hrs, Volume= 0.097 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 202.49' @ 12.22 hrs Surf.Area= 3,264 sf Storage= 4,125 cf
 Flood Elev= 203.51' Surf.Area= 3,619 sf Storage= 7,587 cf

Plug-Flow detention time= 101.9 min calculated for 0.282 af (88% of inflow)
 Center-of-Mass det. time= 63.5 min (838.4 - 774.8)

Volume	Invert	Avail.Storage	Storage Description
#1	201.00'	7,587 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
201.00	2,263	0	0
202.00	2,927	2,595	2,595
202.30	3,131	909	3,504
202.50	3,268	640	4,144
203.50	3,619	3,444	7,587

Device	Routing	Invert	Outlet Devices
#1	Primary	199.33'	4.0" Round Underdrain Pipe L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 199.33' / 198.83' S= 0.0050 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Secondary	202.30'	15.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Device 1	201.00'	2.400 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 198.00'

Primary OutFlow Max=0.25 cfs @ 12.22 hrs HW=202.48' (Free Discharge)

↑1=Underdrain Pipe (Passes 0.25 cfs of 0.35 cfs potential flow)

↑3=Exfiltration (Controls 0.25 cfs)

Secondary OutFlow Max=2.80 cfs @ 12.22 hrs HW=202.48' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 2.80 cfs @ 1.02 fps)

Post UDSF -Design

Type III 24-hr 25 YEAR Rainfall=5.80"

Prepared by Terradyn Consultants LLC

Printed 11/20/2024

HydroCAD® 10.10-5a s/n 11715 © 2020 HydroCAD Software Solutions LLC

Summary for Pond USDF: Terradyn Proposed

Inflow Area = 1.025 ac, 20.00% Impervious, Inflow Depth > 3.77" for 25 YEAR event
 Inflow = 4.29 cfs @ 12.12 hrs, Volume= 0.322 af
 Outflow = 4.05 cfs @ 12.16 hrs, Volume= 0.240 af, Atten= 5%, Lag= 2.5 min
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Secondary = 4.05 cfs @ 12.16 hrs, Volume= 0.240 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 202.53' @ 12.16 hrs Surf.Area= 3,280 sf Storage= 4,254 cf
 Flood Elev= 203.51' Surf.Area= 3,619 sf Storage= 7,587 cf

Plug-Flow detention time= 102.7 min calculated for 0.240 af (74% of inflow)
 Center-of-Mass det. time= 43.6 min (818.4 - 774.8)

Volume	Invert	Avail.Storage	Storage Description
#1	201.00'	7,587 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
201.00	2,263	0	0
202.00	2,927	2,595	2,595
202.30	3,131	909	3,504
202.50	3,268	640	4,144
203.50	3,619	3,444	7,587

Device	Routing	Invert	Outlet Devices
#1	Primary	199.33'	4.0" Round Underdrain Pipe X 0.00 L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 199.33' / 198.83' S= 0.0050 ' / Cc= 0.900 n= 0.012, Flow Area= 0.09 sf
#2	Secondary	202.30'	15.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Device 1	201.00'	2.400 in/hr Exfiltration X 0.00 over Surface area Conductivity to Groundwater Elevation = 198.00'

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=201.00' (Free Discharge)

↑1=Underdrain Pipe (Controls 0.00 cfs)

↑3=Exfiltration (Controls 0.00 cfs)

Secondary OutFlow Max=3.97 cfs @ 12.16 hrs HW=202.53' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 3.97 cfs @ 1.15 fps)

ATTACHMENT 5

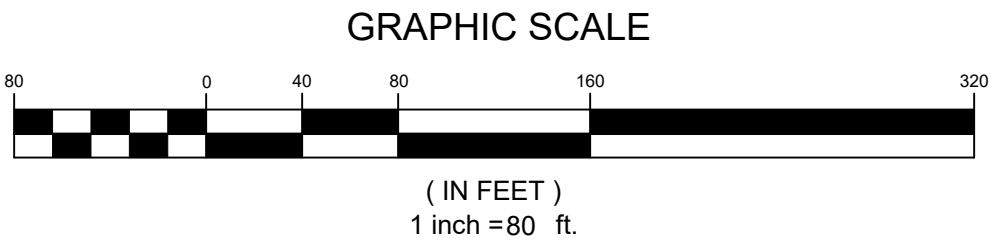
Attachment 5 – Water Quality Treatment Table and Treatment Maps

												SF	AC	CANADA HILL SUBDIVISION - PHASE I				
New Impervious Area (SF) =												60000	1.38					
New Landscaped Area (SF)=												180000	4.13					
New Developed Area (SF) =												240000	5.51					
New Linear Landscaped Area (SF) =												35635	0.82					
New Linear Impervious Area (SF) =												46605	1.07					
New Linear Developed Area (SF) =												82240	1.89					
	Area/Lot #	New Linear Impervious Area (SF)	Total Linear Impervious Area Treated (SF)	New Lot Impervious Area (SF)	Total Lot Impervious Area Treated (SF)	New Linear Landscaped Area (SF)	Total Linear Landscaped Area Treated (SF)	New Linear Developed Area (SF)	Total Linear Developed Area Treated (SF)	New Lot Landscaped Area (SF)	Total Lot Landscaped Area Treated (SF)	Lot Developed Area (SF)	Total Lot Developed Area Treated (SF)	MeDEP Incremental Linear Roadway Treatment % (Impervious)	MeDEP Incremental Linear Roadway Treatment % (Developed)	Town Lot Incremental Treatment % (Impervious)	Town Lot Incremental Treatment % (Developed)	MeDEP BMP
Watershed																		
1	Lot 1			5000	5000					15000	15000	20000	20000			8.33%	8.33%	UDSF
	Lot 2			5000	5000					15000	15000	20000	20000			8.33%	8.33%	UDSF
	Lot 3			1000	1000					6000	6000	7000	7000			1.67%	2.92%	UDSF
2	Lot 4			4000	4000					9000	9000	13000	13000			6.67%	5.42%	Wet Pond
	Lot 5			5000	5000					15000	15000	20000	20000			8.33%	8.33%	Wet Pond
	Lot 6			5000	5000					15000	15000	20000	20000			8.33%	8.33%	Wet Pond
	Lot 7			5000	5000					15000	15000	20000	20000			8.33%	8.33%	Wet Pond
	Lot 12			5000	5000					14000	14000	19000	19000			8.33%	7.92%	Wet Pond
3	Lot 12			0	0					1000	1000	1000	1000			0.00%	0.42%	Lot Buffer
	Lot 13			5000	5000					15000	15000	20000	20000			8.33%	8.33%	Lot Buffer
4	Lot 8			5000	4000					15000	10000	20000	14000			6.67%	5.83%	Lot Buffer
	Lot 9			5000	2500					15000	5000	20000	7500			4.17%	3.13%	Lot Buffer
	Lot 10			5000	5000					15000	15000	20000	20000			8.33%	8.33%	Lot Buffer
	Lot 11			5000	2500					15000	10000	20000	12500			4.17%	5.21%	Lot Buffer
5	Roadway Sta 7+30 - Sta 19+50	32950	32950			25625	25625	58575	58575					70.70%	71.22%			Wet Pond
6	Roadway Sta 5+30 - Sta 7+30 Lt	2200	2200			2800	2800	5000	5000					4.72%	6.08%			UDSF
7	Roadway Sta 0+00 - Sta 5+25	8175	0			5775	0	13950	0					0.00%	0.00%			Level Spreader 3
8	Roadway Sta 5+25 - Sta 7+30 Rt	3280	0			1435	0	4715	0					0.00%	0.00%			Bio Filter
	Subtotal	46605	35150	60000	54000	35635	28425	82240	63575	180000	160000	240000	214000	75.4%	77.3%	90.0%	89.2%	

Note:
1. Water Quality Design Criteria: Assumed 20,000 SF of developed area per lot with 15,000 SF of landscaped area and 5,000 SF of impervious area.
2. For smaller lots or lots with substantial proposed forested buffer easements, the assumed developmemnt area was reduced to 15,000 SF per lot with 10,000 SF of landscaped area and 5,000 SF of impervious area.



- WATERSHED BOUNDARY
- LEVEL SPREADER
- PROPOSED FORESTED BUFFER
- LEVEL SPREADER #1 DRAINAGE AREA
- FORESTED BUFFER
- WET POND
- LINEAR & NON-LINEAR NO TREATMENT AREAS
- UDSF



DATE: 11/21/2024
P.E.: 10167

NO.	DATE	REVISIONS
2	11/21/2024	AMENDED MAJOR SUBDIVISION - FINAL PLAN RESUBMISSION
1	10/10/2024	AMENDED MAJOR SUBDIVISION - FINAL PLAN SUBMISSION

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

41 CAMPUS DRIVE
SUITE 301
NEW GLOUCESTER, ME 04260

OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradync consultants.com

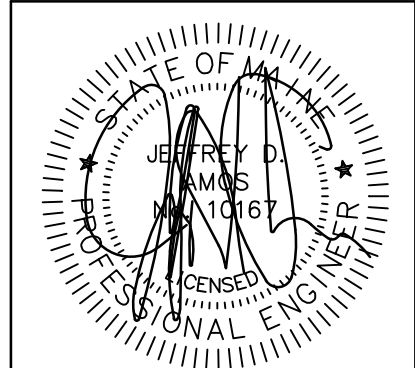
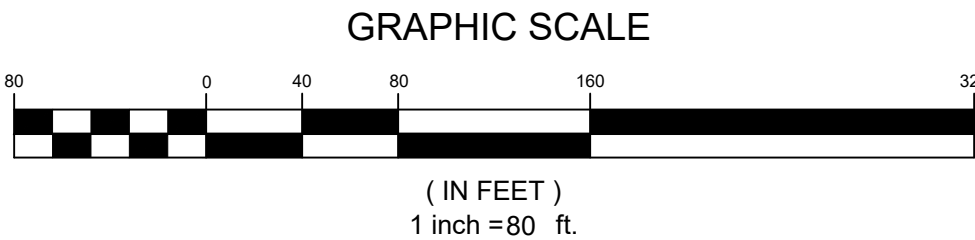
Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PROJECT:	AMENDED MAJOR SUBDIVISION
SHEET TITLE:	CANADA HILL SUBDIVISION
POST DEV. TREATMENT MAP	
CLIENT:	CIARRA CHASE
P.O. BOX 897	WESTBROOK, MAINE 04098
DATE:	11/21/2024
SCALE:	1"=80'
DESIGNED:	
JOB NO.:	2065
FILE:	
SHEET	SWP-1.3



LEGEND:

- WATERSHED BOUNDARY
- △ LS1 LEVEL SPREADER



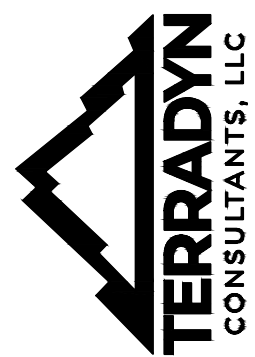
DATE: 11/21/2024
P.E.: 10167

NO.	DATE	REVISIONS	BY
1	11/21/2024	AMENDED MAJOR SUBDIVISION - FINAL PLAN RESUBMISSION	
2	10/10/2024	AMENDED MAJOR SUBDIVISION - FINAL PLAN SUBMISSION	

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PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: AMENDED MAJOR SUBDIVISION CANADA HILL SUBDIVISION	POST DEVELOPMENT AERIAL MAP
SHEET TITLE:	
CLIENT: CIARRA CHASE P.O. BOX 897 WESTBROOK, MAINE 04098	
DATE:	11/21/2024
SCALE:	1"=80'
DESIGNED:	
JOB NO.:	2065
FILE:	
SHEET	SWP-1.4