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- ROADWAY DESIGN
- ENVIRONMENTAL ENGINEERING
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- AIRPORT ENGINEERING
- SITE PLANNING
- CONSTRUCTION ADMINISTRATION

LONG CREEK WATERSHED MANAGEMENT PLAN
PRIORITY CATCHMENT E-24 AND E-34 RETROFIT ALTERNATIVES
ANALYSIS TO PROTECT FUTURE DEVELOPMENT AT 415
PHILBROOK AVENUE

APPLICANT: Philbrook Avenue Associates LLC

PREPARED BY: DeLuca-Hoffman Associates, Inc

OBJECTIVE:

The purpose of this analysis was to review the proposed retrofits for priority catchments E-24 and E-34 and develop an alternative retrofit(s) utilizing the base sizing data provided in the appendices of the Long Creek Watershed Management Plan (the Plan). The goal of the alternate retrofit is to generate a solution that will provide an equivalent treatment volume at a reasonable cost and protect the ability of Philbrook Avenue Associates LLC (Applicant) to construct an approximately 23,500 SF building expansion and associated parking in the southern corner of the lot in the future.

PRIORITY CATCHMENT BACKGROUND INFORMATION:

Priority Catchment E34 (see Figure 2) represents both the Applicant's parcel and the Hannaford Bros Co. lot. Retrofits proposed for the E34 catchment as presented in the Long Creek Watershed Management Plan are as follows:

- Tier 1 – Retrofit SPO_38 - Expand and enhance the Shopping Plaza's existing stormwater detention basin to provide improved water quality treatment. This is the small basin just to the side of the TJ Maxx retail space.
- Tier 2 – Retrofit SPO_28, 35, 36 and 37 – Locate small water quality filters in greenspace portions of the existing parking lot and loading dock for additional levels of treatment.
- Tier 3 – Additional water quality enhancements – Install above or below grade filters to bring catchment up to current standards.

The combined area of catchment E-34 tributary to the area of interest on the Applicant's parcel is 10.03 impervious acres including rooftop, parking and roadway.

Priority Catchment E24 (see Figure 1) is a portion of the Maine Mall and associated parking and drives. Retrofits proposed for the E24 catchment as presented in the Long Creek Watershed Management Plan are as follows:

- Tier 1 – Retrofit SPO_34 and GGP Wetpond - Expand and enhance the two existing dry detention basins at their outlets to provide improved water quality treatment. The

SPO_34 retrofit basically involves the existing basin located at the south side of the Philbrook Avenue site.

- Tier 2 – Retrofit SPO_30 and SPO_89 – Locate additional water quality filters in the setback along Philbrook Avenue to manage municipal contributions in this catchment. SPO_30 would be located adjacent the Macaroni Grill site and SPO_89 is located in the GGP Mall property.
- Tier 3 – TBD – provide additional retrofits as needed to maximize value of SPO_34.

The part of priority catchment E-24 tributary to the area of interest on the Applicant’s parcel is 39.50 impervious acres including rooftop, parking and roadway, all of which is located offsite.

The proposed 23,500 SF building addition is located where the SPO_38 retrofit is proposed. This is also the general location of the existing detention basin proposed for expansion and enhancement. DeLuca Hoffman Associates, Inc. investigated shifting the location of an equivalent improvement area to SPO_38, towards the north west (closer to the Macaroni Grill). As part of this review we identified the need to confirm whether there would not only be sufficient space for SPO_38 but also leave sufficient area for the goal of retrofit SPO_34 to be achieved.

WATER QUALITY BASIS OF DESIGN:

The basis of design for all the proposed retrofits in the Plan is generally associated with a runoff treatment volume from a defined contributing area. The treatment volume is computed by multiplying the tributary area by a prescribed rainfall treatment depth allocated for each retrofit in the Long Creek Watershed Management plan. The key to generating an alternate retrofit is to be able to demonstrate that an equivalent treatment volume can be provided in an alternative alignment to that prescribed in the Plan.

The following table lists all the retrofits, the contributing area, prescribed treatment depth and associated treatment volumes tributary to the general location of SPO_34 and SPO_38 as shown on the accompanying figures. These values are presented in the Plan appendices.

Retrofit ID#	Impervious Area (acres)	Prescribed Treatment Depth (Inches)	Treatment Volume (CF)
SPO_034	39.00	0.53	75,032
SPO_030	0.50	1.65	2,995
SPO_035	0.25	1.00	908
SPO_036	0.56	1.34	2,724
SPO_037	0.59	1.00	2,141
SPO_038	8.98*	0.59	19,232
SPO_028	0.25	1.08	980
		TOTAL	104,012

* This area includes 0.6 acres of impervious area for the future expansion

PROPOSED ALTERNATE RETROFIT:

With the data available for the Applicant’s Shopping Plaza site, including topography and existing outlet and inlet structure details, DeLuca Hoffman Associates, Inc. has evaluated an option to eliminate the need to construct retrofits SPO_28, SPO_30, SPO_35, SPO_36, SPO_37 and SPO_38 and combine all these tributaries into one large SPO_34 retrofit – either a gravel

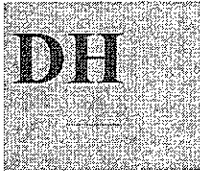
wetland or a soil media filter Best Management Practice (BMP). The accompanying Figure 3 is a concept sketch of this idea.

Based on the table above, the goal treatment volume for the combined retrofits contemplated on the Applicant's site is 25,985 CF. The surface area available to construct a gravel filter or equivalent is approximately 9,200 SF and if we multiply that by a 3 foot depth, the treatment volume would be 27,600 CF which exceeds the goal volume. Figure 3 shows that there is adequate area adjacent the parking lot and the Macaroni Grill site to develop an alternative retrofit BMP to that contemplated as SPO_38 in the Plan.

Based on the table above, the goal treatment volume for the combined SPO_34 BMP would exceed 104,012 CF stored within 3 feet of depth (per appendix 8 of the Long Creek Watershed Management Plan). The surface area of the filter area shown in Figure 3 is approx 34,345 SF, which at 3' depth (between elevation 37 and 40) exceeds the required SPO_34 treatment volume. Thus we have demonstrated that there is adequate volume and hence functional equivalency within the area available to also construct the SPO-34 retrofit measure. It is our understanding that this alternative could be constructed at reasonable cost and eliminates the need to disturb several small areas on the site and the associated complications with existing utilities etc.

CONCLUSION:

Based on this brief analysis we respectfully submit that the concept shown on Figure 3 provides an alternative area to construct an equivalent treatment volume to that contemplated for SPO-38, with the ability to also continue to provide volume for the broader improvement contemplated under the Plan's SPO-034 retrofit at reasonable cost. The Applicant is seeking District concurrence that this alternative approach can be considered, thus protecting the Applicant's ability for expansion opportunity.



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June 22, 2010

Ms. Tamara Lee Pinard
Cumberland County Soil &
Water Conservation District
35 Main Street, Suite 3
Windham, ME 04062

**Subject: Priority Catchment E-24 and E-34 Retrofit Alternatives Analysis
Preliminary Cost Data
415 Philbrook Avenue, South Portland ME**

Dear Tamara:

Pursuant to your request this morning, we have reviewed the opinion of cost data provided in the Long Creek Watershed Management Plan (the Plan) for each of the proposed retrofits for priority catchments E-24 and E-34 as well as Appendix 7 of the report titled '*Structural Retrofits Opinion of Probable Costs*'.

The following opinion of costs were provided in the plan for each retrofit of interest:

- | | |
|--------------------------------------|------------------------------------|
| • SPO_028, SPO_035, SPO_036, SPO_037 | = \$88,000 |
| • SPO_038 | = \$85,000 |
| • SPO_030 | = \$27,750 (assume 50% of tier 2) |
| • SPO_034 | = \$372,500 (assume 50% of tier 1) |

TOTAL = \$573,250

Assuming the proposed alternate design is a 'Gravel Wetland', according to Appendix 7 of the Plan the prescribed cost per square foot (at the water quality storage depth) is \$13.39. The proposed alternative retrofit, which consolidates all the above listed retrofits into one large retrofit, at depth 3 feet has a surface area of 41,883 SF. Based on a cost of \$13.39/SF, the cost of the proposed alternative would be approximately **\$560,813**. As such our office believes the two approaches to be functionally equivalent (as described in the report provided earlier today) as well as financially equivalent. It is important also to note, that from the existing data our office has, the smaller Plan retrofits, for example SPO_028, 036 and 037, will involve significant additional costs associated with utility relocation and disturbance to the existing facilities on the site.

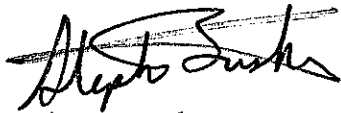
The data above provides preliminary data related to project costs. Neither the Plan retrofits nor the alternative approach are 'engineered' designs and it is expected that site specific conditions including

Ms. Tamara Lee Pinard
June 22, 2010
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soils and existing utilities (to be identified during detailed design) will effect these costs regardless of the approach selected by the District.

Sincerely,

DeLUCA-HOFFMAN ASSOCIATES, INC.



Stephen R. Bushey, P.E.
Senior Engineer

SRB/rjw/JN2404.03/Pinard-6-22b-10

Cc: Lou Masiello (Philbrook Avenue Associates LLC)

CATCHMENT E-24

Catchment Characteristics

DEP ID E-24

Size 66 acres

Impervious Cover Breakdown

Rooftop 24% (14 acres)

Parking 75% (45 acres)

Roadway 1% (0.6 acres)

Existing Stormwater Management System - Yes
 Stormwater Infrastructure Ownership – Private with minor municipal component

Opportunity Overview

Tier 1: Expand and enhance the two dry detention basins at the outlet of each stormwater drainage system to provide improved water quality treatment.

Tier 2: Locate additional water quality filters in setback portion along Philbrook Ave to manage municipal contribution in this catchment. A small demonstration raingarden could be located near north entrance to Macy's in current concrete median if soils are deemed to be appropriate.

Tier 3: Enhance drainage plan maps and provide additional retrofits as needed to maximize value of SPO_034.

Tier	Retrofit ID#	Estimated Cost
1	SPO_034, GGP Wet Pond	\$745,000
2	SPO_030 SPO_089	\$55,500
3	TBD	\$0

Considerations

Discrepancies and missing data on storm drain infrastructure maps should be rectified prior to design. SPO_034 may require expansion in order to accommodate 0.5" of rainfall runoff. Soil Filter SPO_030 may require drainage easement acquisition. GGP (General Growth Properties) Wet Pond retrofit based on previous design under GGP Stormwater Master Plan.



CATCHMENT E-34

Catchment Characteristics

DEP ID E-34
Size 11 acres

Impervious Cover Breakdown
 Rooftop 24% (2.4 acres)
 Parking 67% (6.7 acres)
 Roadway 9% (0.9 acres)
 Existing Stormwater Management System - Yes
 Stormwater Infrastructure Ownership - Private

Opportunity Overview –

Tier 1: Expand and enhance the Hannaford Shopping Plaza's existing stormwater detention basin to provide improved water quality treatment.

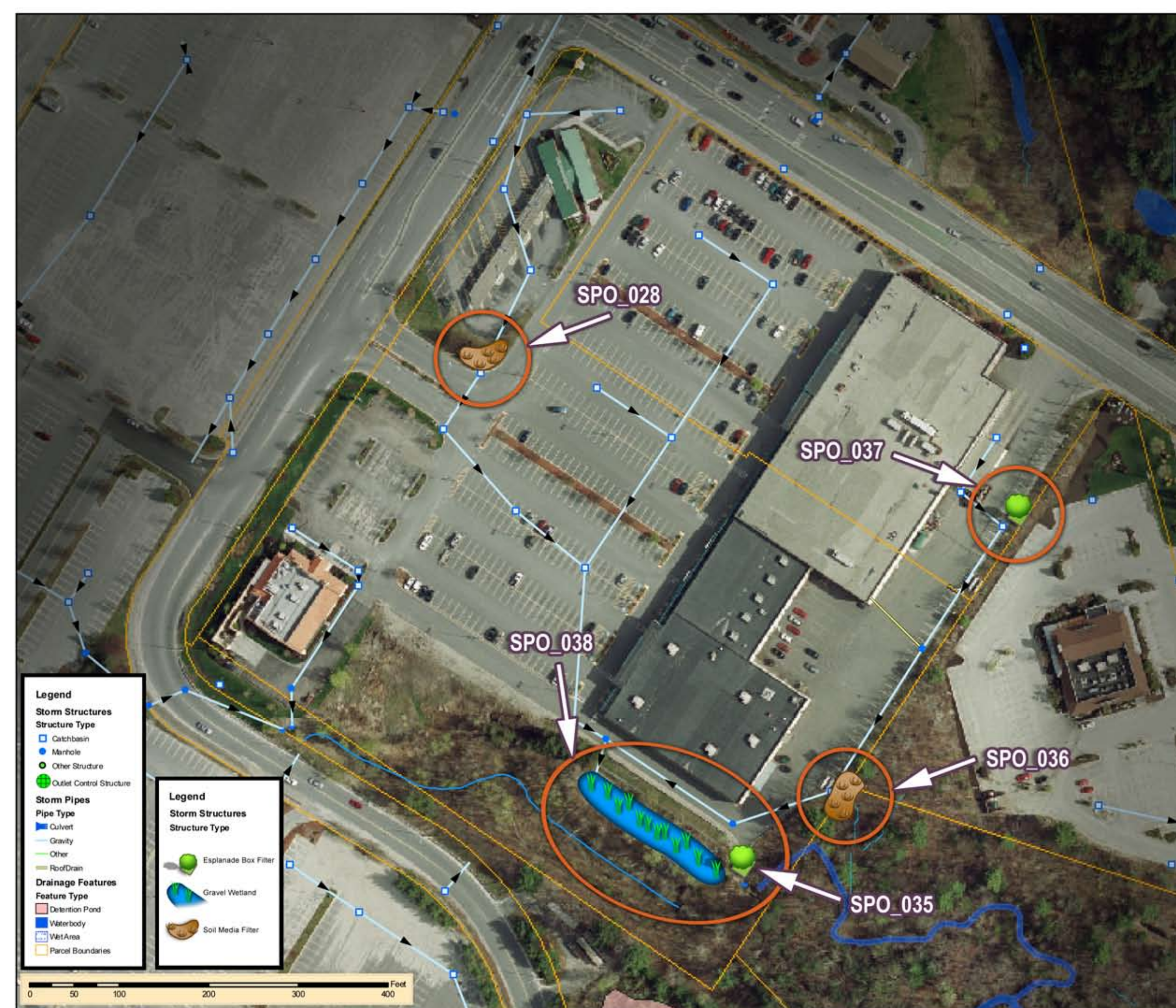
Tier 2: Locate water quality filters in greenspace portions of the parking lot and loading dock area for additional levels of water quality treatment.

Tier 3: If necessary, install above or below grade filters to bring the catchment up to current stormwater standards.

Tier	Retrofit ID#	Estimated Cost
1	SPO_038	\$85,000
2	SPO_028 SPO_037 SPO_036 SPO_035	\$88,000
3	Additional IC WQ enhancements	\$186,000

Considerations

The current wet pond diversion structure may require reconfiguration or reconstruction for the new stormwater management system. Soil Filter SPO_036 would likely require some tree removal and drainage easement acquisition.



FUTURE EASEMENT FROM PHILBROOK AVENUE ASSOCIATES LLC TO LONG CREEK WATERSHED MANAGEMENT DISTRICT

NOTE: LIMITS OF ALTERNATE RETROFIT INCLUDES TREATMENT VOLUME FOR PROPOSED EXPANSION AREA

**PROPOSED ALTERNATE RETROFIT SPO_034 GRAVEL WETLAND OR SOIL FILTER
BASE SURFACE AREA = 34,345 SF**

PROPOSED FUTURE ADDITIONAL PARKING

PROPOSED FUTURE 23,500 SF BUILDING ADDITION

ORIGINAL SPO_034 AREA

ORIGINAL SPO_038 AREA

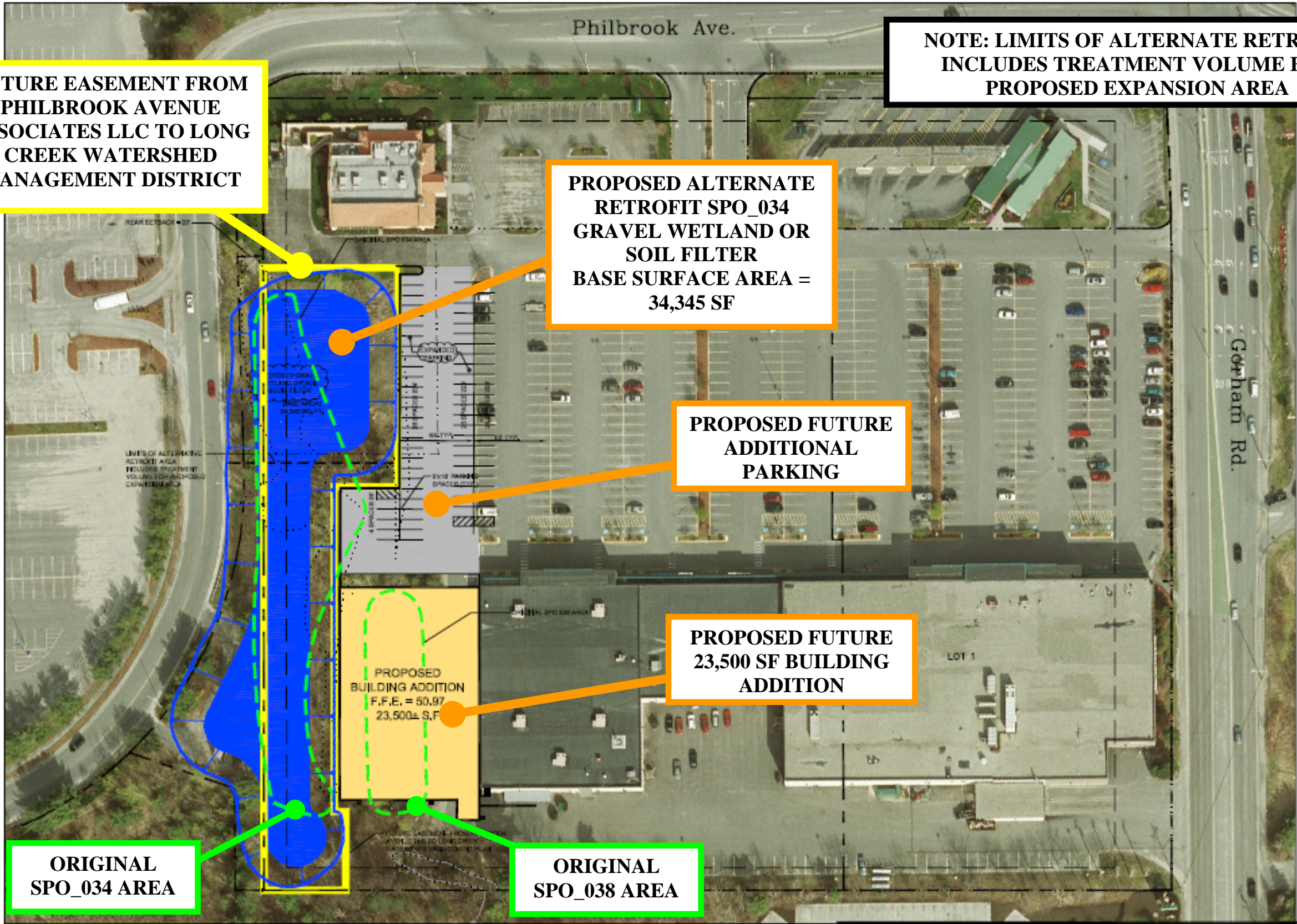


FIGURE 3



REV	DATE	DESCRIPTION
2	6/16/20	SUBMITTED TO CLIENT FOR REVIEW
1	6/16/20	SUBMITTED TO CLIENT FOR REVIEW
REV	DATE	DESCRIPTION

P.E. STEPHEN BUSHBY
LIC. #7420

PHILBROOK AVENUE LLC STORMWATER
MANAGEMENT IMPROVEMENTS
SHEET TITLE
CONCEPT SKETCH PLAN
CLIENT
PHILBROOK AVENUE
ASSOCIATES, LLC

D&L LUCIA-HOFFMAN
ASSOCIATES, INC.
17500 STREET SW
SUITE 1000
LYNN, WA 98035
WWW.DLCONTRACTORS.COM
DRAWN: RUN DATE: JUNE 2020
DESIGNED: RUN SCALE: 1" = 40'
CHECKED: SRB JOB NO. 2404.02
FILE NAME: 2404-SP
SHEET 1