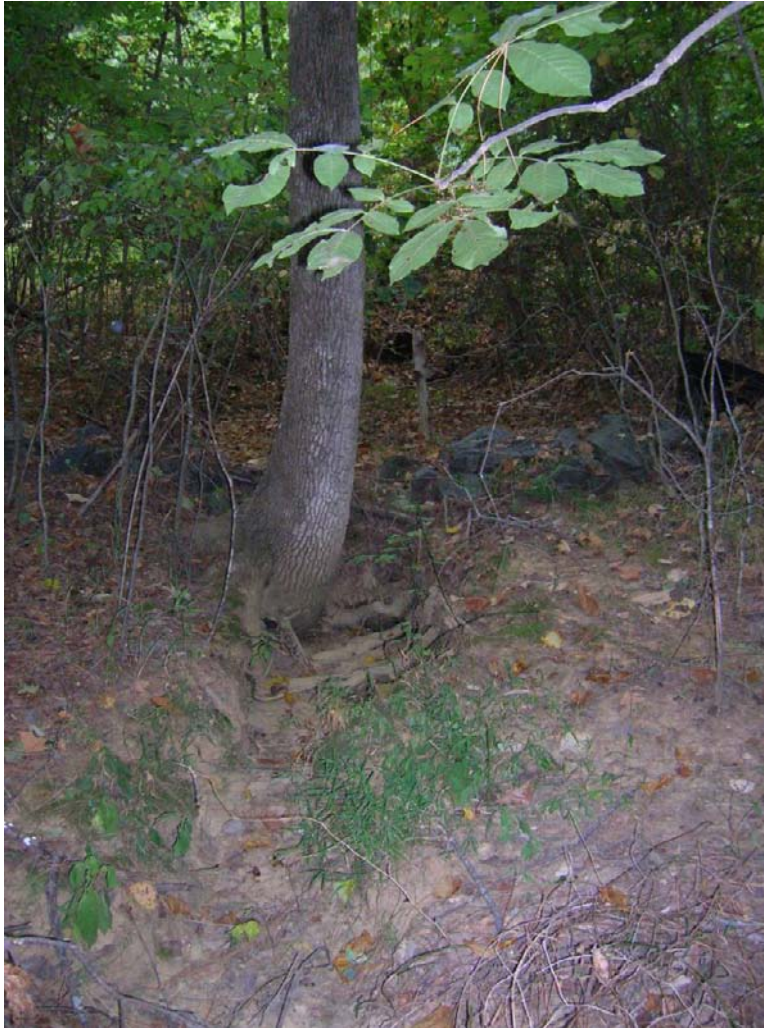


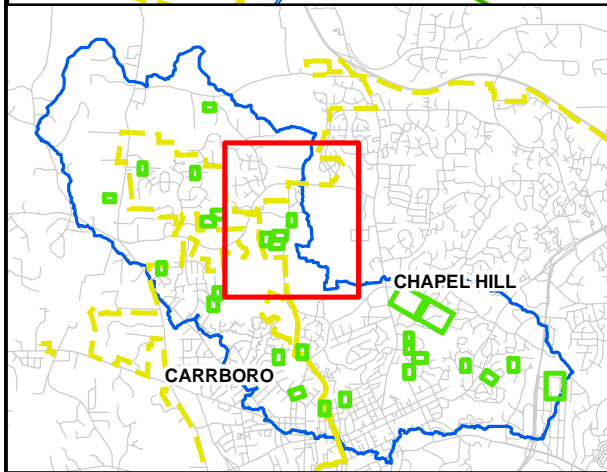
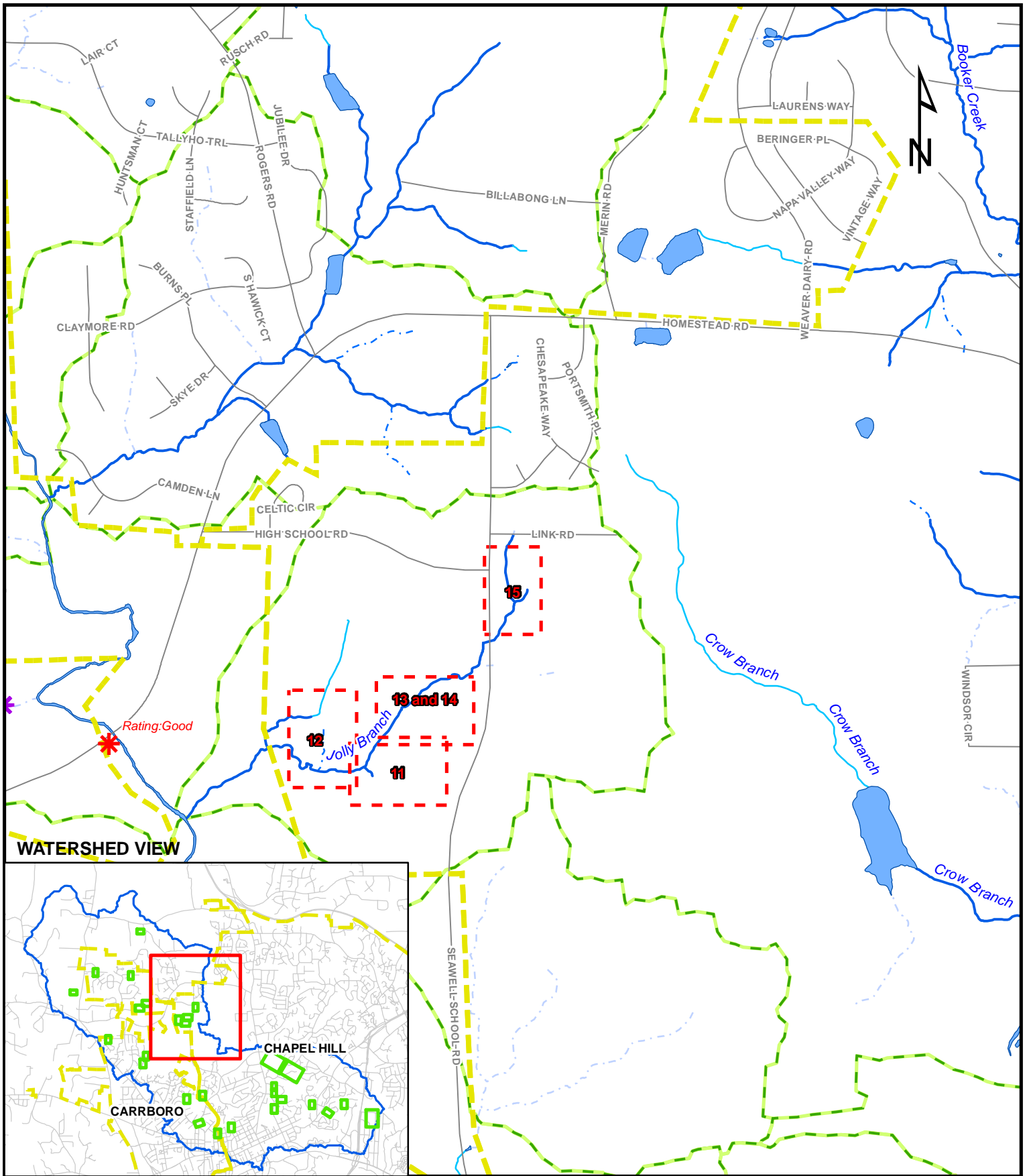
SITE 15

Retrofit of Existing Sediment Basin

Index Sheet No.: 17
Raw Data Name: IJ 26



Estimated Construction Cost: \$27,300



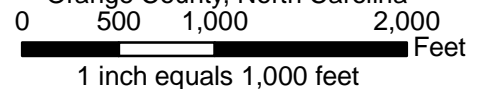
Legend

- Ambient Monitoring
- Benthic Monitoring
- Fish Sampling
- Municipal Boundary
- Orange County Roads
- Subwatersheds
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- Stream, unknown flow



**SITE 15
VICINITY MAP**

Geomorphic Analysis and Identification of Potential Sites for Stormwater BMPs
Orange County, North Carolina



Project Description

	Drainage Area (acres)	Impervious Area (acres)	% Impervious
Site 15	11.7	1.7	14.7%

Location

Site 15 is located south of a gravel driveway, at its intersection with Seawell School Road. Chapel Hill High School and Smith Middle School are across the street from the site.

Problem Description

Site 15 consists of an existing sediment basin at the outlet of a culvert passing under a gravel driveway. The basin was likely constructed along with the driveway and the church to which the driveway leads to collect sediment from runoff during construction. The basin has filled in, and consists only of a remnant rip rap berm and a large flat area of silt and clay at an elevation equal to the berm. Stormwater from the culvert currently passes over the basin without any retention or detention, and then concentrates into a scoured drainage channel just downhill of the basin. The drainage channel deepens into a headcut just before reaching a perennial stream, Jolly Branch, approximately one hundred feet from the basin. Due to these existing conditions, there is no water quality treatment, sediment is exported from the actively eroding channel, and a headcut is advancing towards the basin, threatening to create an even deeper gully.

Sites 11 through 15 are in close proximity to each other, and could therefore be integrated amongst themselves as a single package. In addition, other similar opportunities for the work proposed here are present throughout the three surrounding campuses, as well as other parts of the Jolly Branch watershed.

Proposed Solution

The existing basin of Site 15 is a prime candidate for a BMP retrofit in the form of a stormwater wetland to provide water quality treatment and peak flow attenuation. The retrofit could be facilitated by expanding the surface area of the current sediment basin, and digging out the accumulated sediment to create areas of shallow land, shallow water and deep pools. The site is a desirable one for a stormwater BMP retrofit in that the amount of earthwork will be minimal. In addition to the construction of a stormwater wetland, the existing erosive channel and headcut should also be stabilized. This can be done by creating a level spreader below the outlet of the wetland, which would cause stormwater to overflow diffusely through the floodplain and into the stream without concentrating the convergence at one location.

Benefits of the project would include the following:

- Attenuation of peak flows and relief of the main channel of Jolly Branch to keep it stable

*Bolin Creek Watershed
Geomorphic Analysis and Potential Site Identification for Stormwater BMPs and Retrofits*

- Water quality treatment of the contributing drainage area.
- Reduction of peak flow
- Possible baseflow augmentation from the water stored in the wetland

The current nutrient export rates, and potential benefit of a stormwater wetland here have been calculated based on land use, drainage area and percent imperviousness of the drainage area, and are displayed in **Table 15.1**:

Table 15.1

SITE 15	Pollutant Load (lbs)		
	TN	TP	TSS
EXISTING CONDITION	2.99	0.19	87.54
STORM WATER WETLAND TREATMENT REMOVAL %	37.00%	35.00%	85.00%
NET REDUCTION	1.11	0.07	74.41
FUTURE CONDITION	1.88	0.12	13.13

Constraints

Site 15 is heavily wooded, and care would therefore have to be taken to protect the larger trees on the site during construction. During field visits, it was observed that a large, dead maple is still standing just downhill of the sediment basin. This could be removed and provide a significant amount of the surface area for the expansion of the basin into a stormwater wetland.

Alternatives

No alternatives are proposed for this site.

Cost-Estimate Breakdown

Table 15.2 shows a conceptual itemized cost estimate. These costs represent construction and maintenance costs only. The cost for stormwater wetlands is derived from an equation developed by Brown and Schueler (1997).

*Bolin Creek Watershed
 Geomorphic Analysis and Potential Site Identification for Stormwater BMPs and Retrofits*

Table 15.2
SITE 15 Construction Cost

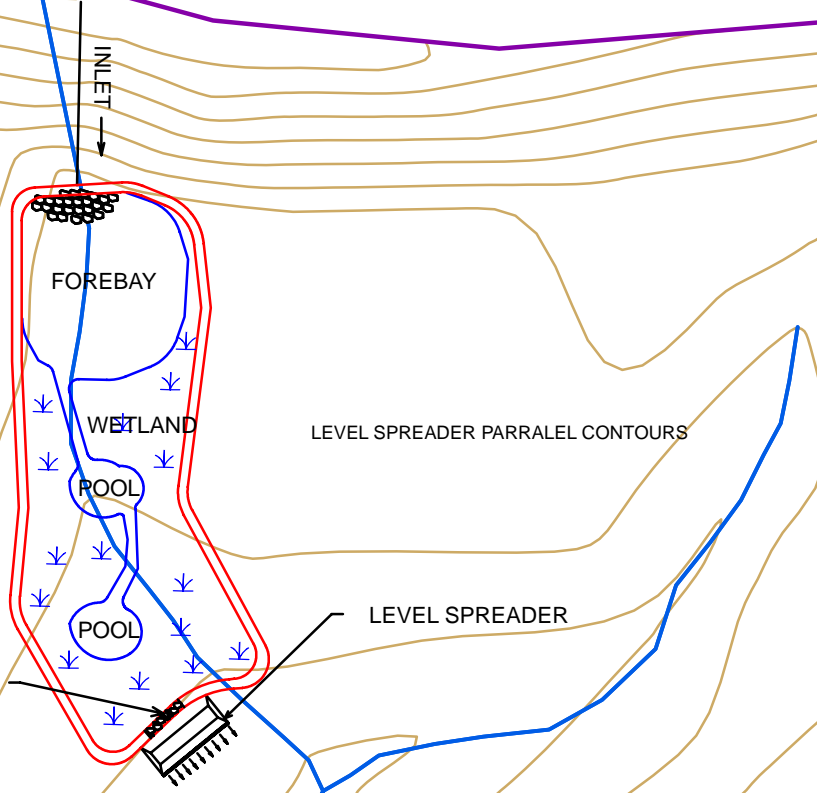
Pay Item Description	Estimated Quantity	Unit	Unit Bid Price	Bid Amount
Stormwater Wetland	13986.0	CF	Equation Derived	\$23,709
Total				\$23,709
Mobilization (5%)	1.0	LS		\$1,185
Contingencies (10%)	1.0	LS		\$2,371
Total + Mobilization and Contingencies				\$27,266
Maintenance Costs				
Maintenance (5% of base construction cost)	1.0	Year		\$1,363

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HIGH SCHOOL RD

SEAWELL SCHOOL RD



FOREBAY

WETLAND

POOL

POOL

LEVEL SPREADER PARRALEL CONTOURS

LEVEL SPREADER

WEIR OUTLET

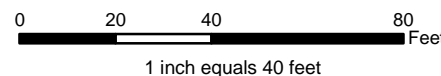
Jolly Branch

Legend

- Stormwater Lines
- Impervious Surfaces
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- Stream, unknown flow
- Contours



CONCEPTUAL PLAN VIEW
 BOLIN CREEK WATERSHED
 Geomorphic Analysis and Potential Site
 Identification For
 Stormwater Structures and Retrofits

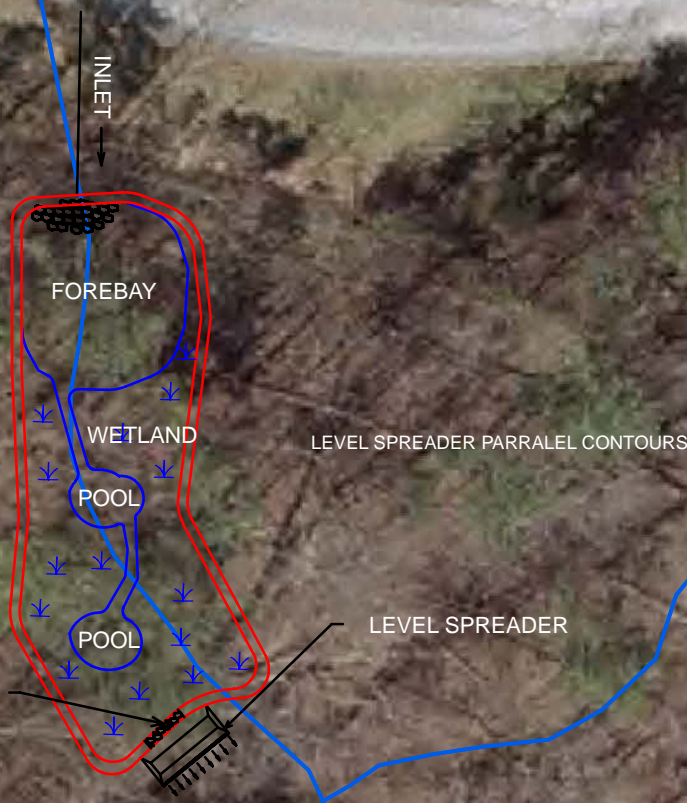




SITE 15

HIGH SCHOOL RD

SEAWELL SCHOOL RD



Jolly Branch

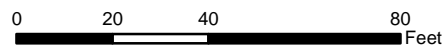
Legend

- Stormwater Lines
- Perennial Stream
- Intermittent Stream
- - - Ephemeral Stream
- - - Stream, unknown flow



AERIAL PHOTO VIEW

BOLIN CREEK WATERSHED
 Geomorphic Analysis and Potential Site
 Identification For
 Stormwater Structures and Retrofits



1 inch equals 40 feet