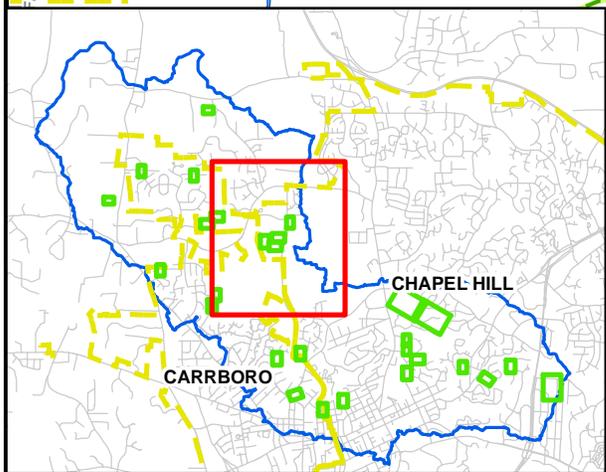
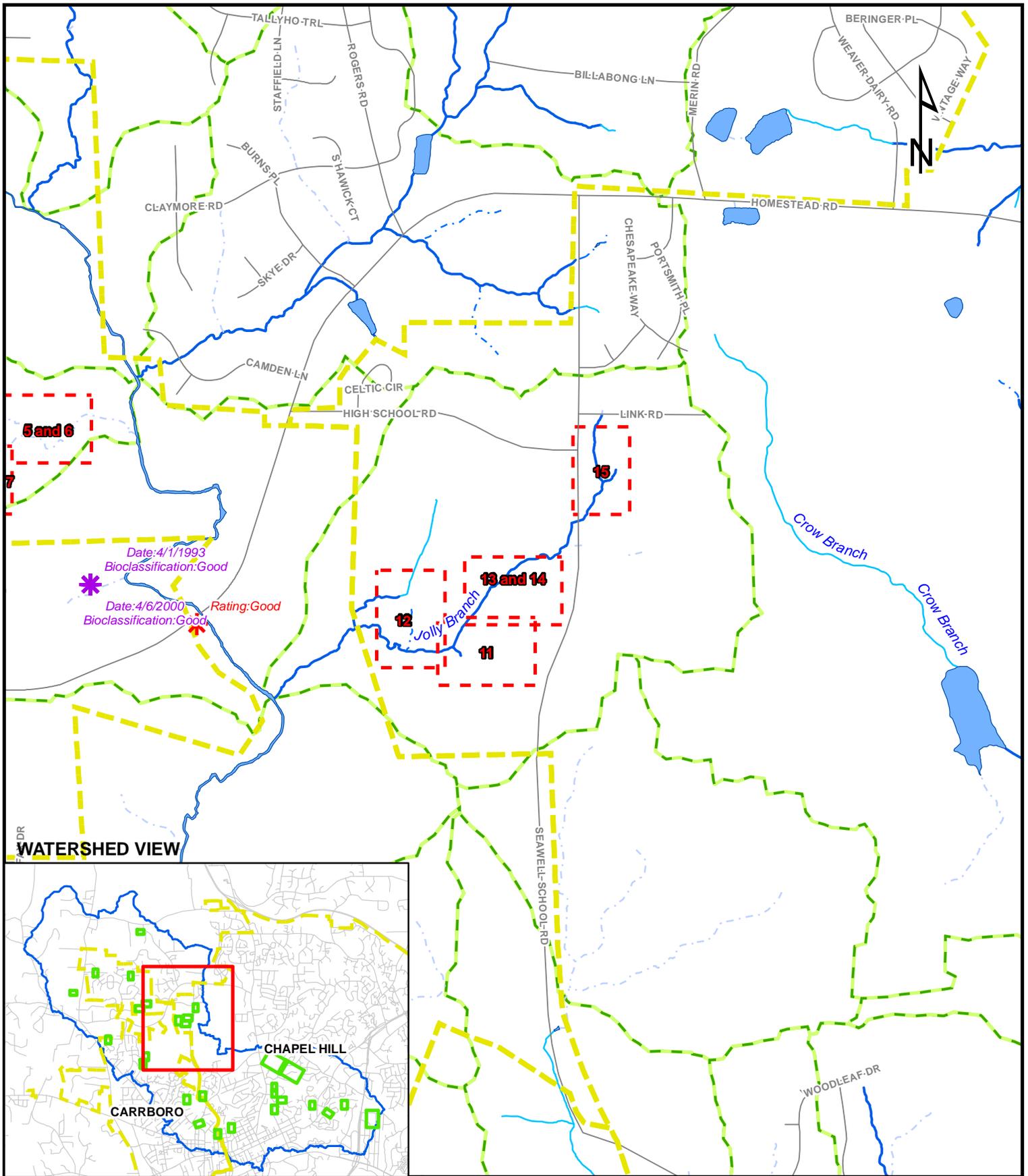


SITE 13

Index Sheet No.: 16
Raw Data Name: IJ 32



Estimated Construction Cost: \$25,700



Legend

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

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SITE 13 and 14 VICINITY MAP

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

0 500 1,000 2,000 Feet

1 inch equals 1,000 feet

Project Description

	Drainage Area (acres)	Impervious Area (acres)	% Impervious
Site 13	1.6	0.02	1.2%

Location

Project 16-03 is located just south of the practice football field at Chapel Hill High School, along a ditch that flows into the perennial stream Jolly Branch. A paved path crosses over the ditch just upstream of the site.

Problem Description

Project 16-03 consists of what was observed to be an ephemeral tributary to Jolly Branch that is currently incised and contains a headcut working upstream towards a paved path. The tributary has been channelized into a ditch, and has a concrete pipe outlet providing stormwater input. The contributing drainage area of this pipe appears to consist of part of the football field at Chapel Hill High School, part of the practice football field, and a portion of the student parking lot. These impervious surfaces are likely contributing pollutants, as well as the nutrients from the fertilization of the football fields, into the ephemeral tributary and into Jolly Branch. The confined ephemeral drainage feature does not have a floodplain or enough surface area to prevent erosion, so bank erosion will continue.

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

Water quality treatment and quantity treatment at Site 13 could be provided by the construction of a small bio-retention area in-line with the tributary. A bio-retention area is preferred over another structural BMP here because of the lack of available space for construction, and the relatively small drainage area. The tributary on which the bio-retention area should be located was observed to be ephemeral, however further verification will be needed to ensure that an in-line BMP can be placed along it. Runoff volume will be stored in underground storage, reducing peak runoff rates and potentially augmenting baseflow.

An under-drain should be used with the bio-retention area, as the in-situ soils are most likely too impermeable to allow infiltration into the surrounding soils. This under drain or pervious drain layer will allow each successive cell to discharge to the next over extended periods of time.

Pollutant reduction rates as a result of stormwater treatment are shown in **Table 13.1**.

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

Table 13.1

SITE 13	Pollutant Load (lbs)		
	TN	TP	TSS
EXISTING CONDITION	27.44	1.70	673.47
BIO-RETENTION TREATMENT	37.00%	45.00%	85.00%
NET REDUCTION	10.15	0.76	572.45
FUTURE CONDITION	17.29	0.93	101.02

Constraints

Site 13 is located in a wooded area, and therefore tree removal will be required.

Alternatives

No alternatives are proposed for this site.

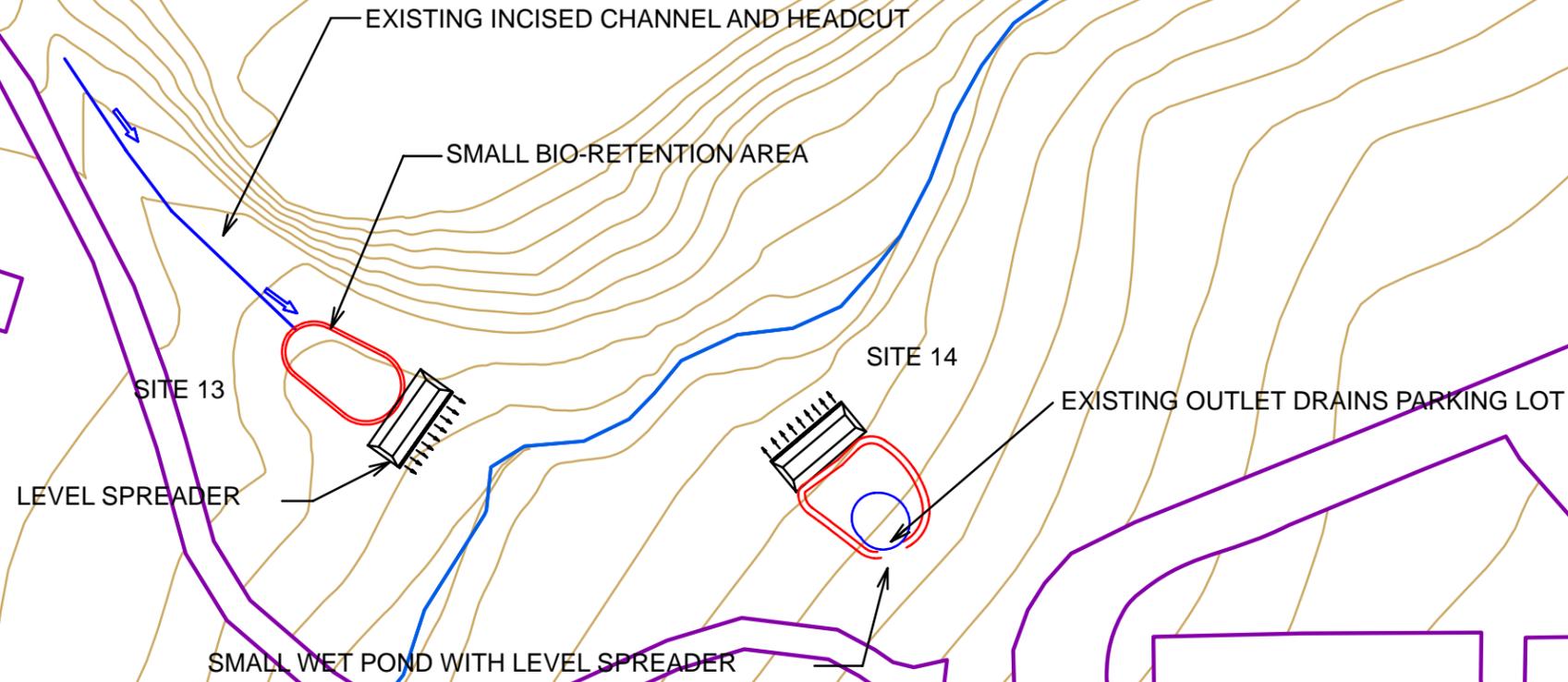
Cost-Estimate Breakdown

Table 13.2 shows a conceptual itemized cost estimate for Site 13. These costs represent construction and maintenance costs only. The cost for the bioretention area is derived from a cost per cubic foot treated for bioretention areas as reported by Schueler, et. al. (2007).

Table 13.2
SITE 13

Pay Item Description	Estimated Quantity	Unit	Unit Bid Price	Bid Amount
Bio-Retention Area	1770.00	CF	12.62	\$22,337
Total				\$22,337
Mobilization (5%)	1.0	LS		\$1,117
Contingencies (10%)	1.0	LS		\$2,234
Total + Mobilization and Contingencies				\$25,688
Maintenance Costs				
Maintenance (5% of base construction cost)	1.0	Year		\$1,284

SITE 13 and 14



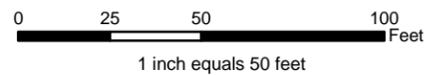
SMITH MIDDLE SCHOOL

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 13 and 14

EXISTING INCISED CHANNEL AND HEADCUT

SMALL BIO-RETENTION AREA

SITE 13

LEVEL SPREADER

SMALL WET POND WITH LEVEL SPREADER

SITE 14

EXISTING OUTLET DRAINS PARKING LOT

Legend

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




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

0 25 50 100 Feet

1 inch equals 50 feet

