

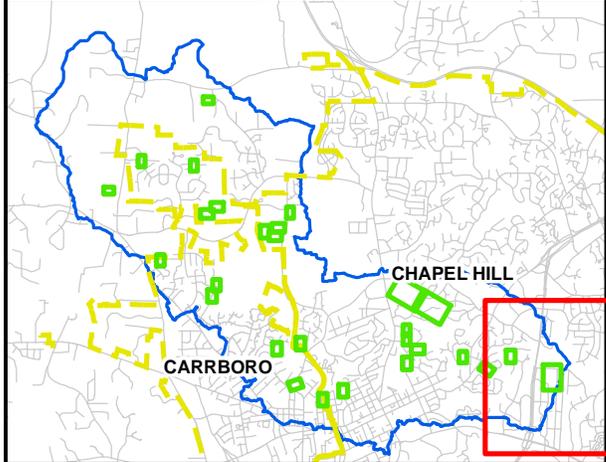
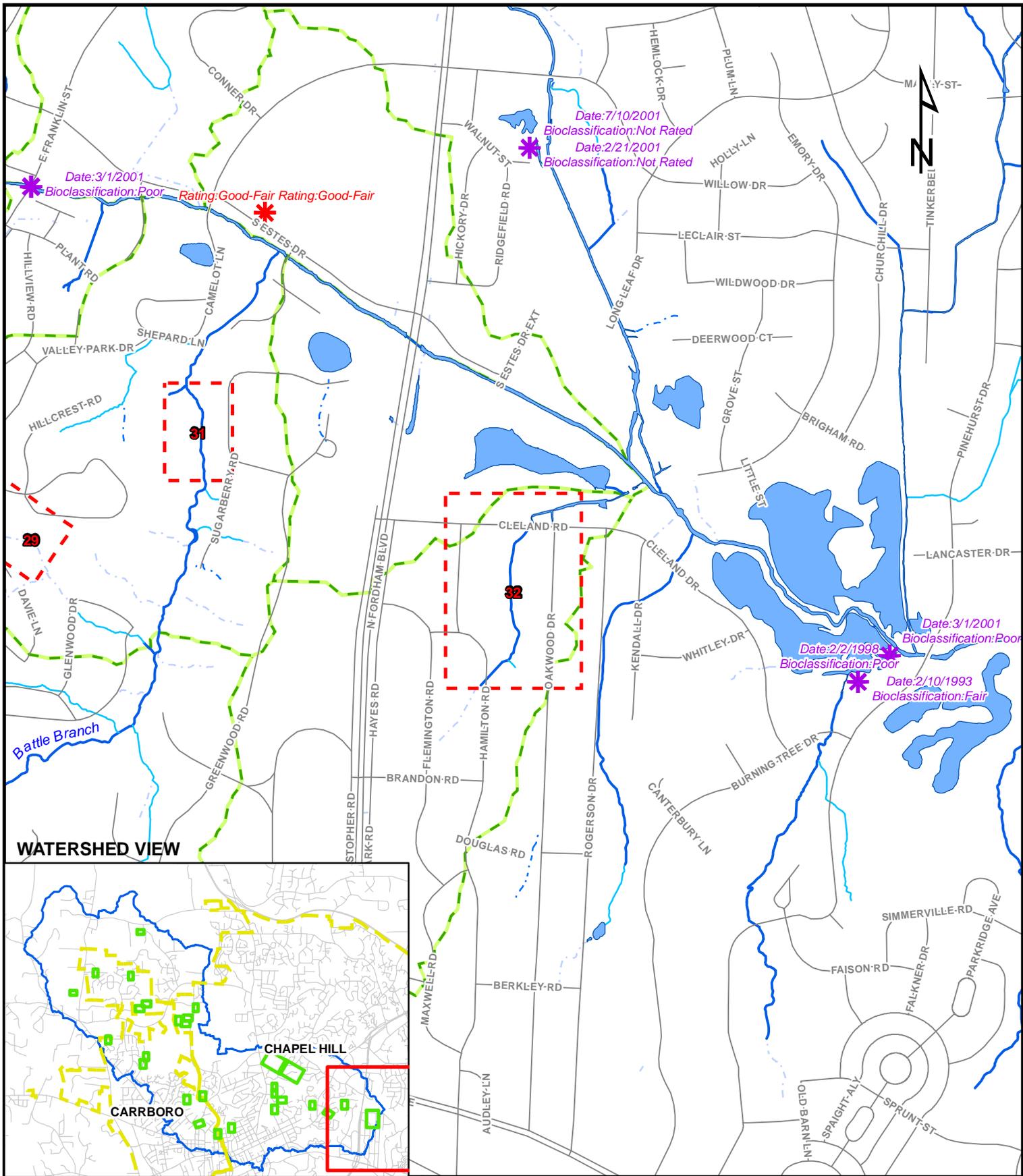
SITE 32

Restoration of Stream channel off Cleland Rd

Index Sheet No.: 34
Raw Data Name: BD 90



Estimated Construction Cost: \$207,000



Legend

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

EarthTech
A tyco International Ltd. Company

SITE 32 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 32	149.6	38.0	25.4%

Location

Site 32 is located to the south of Cleland Rd, near the intersection of Cleland Rd and Oakwood Drive, and approximately 0.2 miles east of the intersection of US 15-501 and Cleland Rd. Several soccer fields are adjacent to the site.

Problem Description

Site 32 consists of a channelized, incised stream channel in the lower portion of the Bolin Creek Watershed. The stream appears to have been channelized and straightened at some point in the past, possibly during construction of the surrounding residential area and soccer fields. The resulting channel is incised and devoid of any natural stream habitat. The relic floodplain of the stream is filled with piles of spoil material, and heavily infested with exotic invasive species such as wisteria, multiflora rose, and privet. The contributing drainage area of the stream is comprised of medium to heavily developed residential areas, and a portion of US 15-501. Most of the stormwater in this drainage area is piped and discharges from an outlet at the southernmost edge of the Site 32. Bank erosion and BEHI ratings of “high” were observed along the entire reach.

Using the BANCS model, it is estimated that approximately 62 tons of sediment are being exported from the site each year. Concomitant nutrient export associated with the sediment has also been calculated and is listed in **Table 32.1**.

Table 32.1

Pre-Treatment	
Estimated Total Sediment Export	62.4 tons/year
Erosion per length of Channel	0.058 tons/yr/ft
Pounds of Nitrogen	124.8 lbs/year
Pounds of Phosphorus	62.4 lbs/year
Post-Treatment	
Estimated Total Sediment Export	3.6 tons/year
Erosion per length of Channel	0.003 tons/yr/ft
Pounds of Nitrogen	7.3 lbs/year
Pounds of Phosphorus	3.6 lbs/year

Proposed Solution

The stream channel that is the focus of treatment at this site is an ideal site for Priority I Restoration. Priority I restoration involves reconnecting the stream with the relic floodplain by raising the elevation of the bed, thereby restoring floodplain hydrology, reducing near bank stress and thus limiting the bank erosion problem. This site possesses ideal circumstances for this practice: a wide, intact relic floodplain and little need to meet elevations, other than the outlet pipe at the upstream end and the roadway culvert at the downstream end. Most of all, almost the entire floodplain is on state owned land, providing ample opportunity for changes in the planform and sinuosity of the stream. Besides the sediment reduction, stream restoration will provide the restoration of critical habitat for numerous aquatic species, as well as the hydrology needed to support riparian wetlands.

A conceptualized plan view of the site, based on average stream variables for the drainage area, is shown in the Plan View of Site 32 contained in this summary.

Constraints

Tree removal will be necessary if restoration is implemented at this site. The spoil piles will also need to be removed, requiring additional earthwork.

Flooding issues may arise if the stream is reconnected to the relic floodplain, thus a flooding analysis and submission of a CLOMR will be required to determine if the project would affect the FEMA 100-year floodzone.

Alternatives

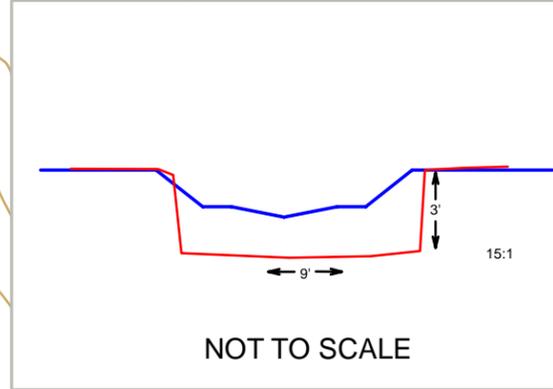
No alternatives are proposed for this site.

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

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CONCEPTUAL CROSS SECTION



HAMILTON RD

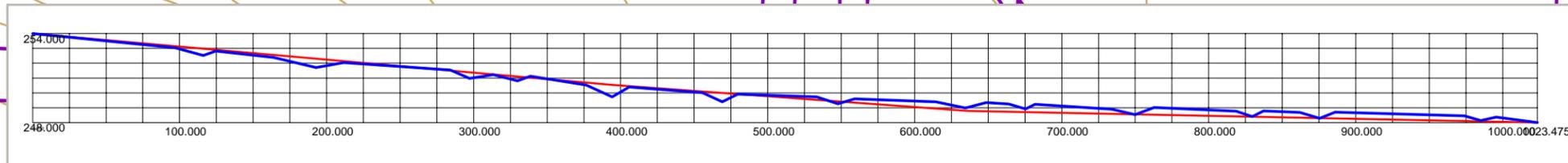
CLELAND RD

CONCEPTUAL STREAM CHANNEL

BEGIN CONSTRUCTION

END CONSTRUCTION

CONCEPTUAL PROFILE



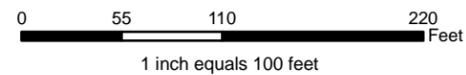
OAKWOOD DR

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 32



HAMILTON RD

CLELAND RD

OAKWOOD DR

CONCEPTUAL CROSS SECTION



CONCEPTUAL STREAM CHANNEL

BEGIN CONSTRUCTION

END CONSTRUCTION

CONCEPTUAL PROFILE



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

0 55 110 220 Feet
 1 inch equals 100 feet