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August 29, 2011

Mr. Frank Fawcett
Primax Properties
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4th Floor
Charlotte, NC 28204-2812
FFawcett@primaxproperties.com

RE: Test Results for Infiltration and Mean Seasonal High Water Table
Proposed Dollar General
South Gastonia, North Carolina
ATC Project #: 45.27739.0056

Gentlemen:

ATC Associates has performed field geotechnical borings hand auger borings, and laboratory index testing on the soils at the above referenced facility.

INVESTIGATION FOR INFILTRATION RATES AND SEASONAL HIGH WATER TABLE

The subject property is located in Gaston County. We understand from conversations with you that the proposed storm water management features will consist of some type of infiltration pond in the area of the existing pond.

ATC observed the property, taking note of the land (slope, drainage patterns, past use, etc.) as well as soil conditions (depth, texture, structure, seasonal wetness, restrictive horizons, etc.) using hand auger borings and one power auger boring. The approximate locations of the borings and tests are shown on the location diagrams in the Appendix to this report.

The existing infiltration pond appears to be constructed in an area of FILL soils. Fill soils were encountered at the bottom of the pond and fill soils were encountered in the soil boring G-7 adjacent to the pond to a depth of about 8 feet.

FIELD AND LABORATORY TESTS

Laboratory testing consisted of visual classification of the soil samples and grain size analysis were also performed in order to estimate the permeability. Based on Hazen's Formula of $k=(D_{10})^2$ where D_{10} is the 10% finer grain size in mm and the estimated permeability of the soils (k) is in cm/sec. Laboratory test results are included in the Appendix.

The soils map from the USDA web site indicates that the basin will be in the area of Cecil Sandy Clay Loam Complex on 8-15% slopes. The Cecil soils are characterized as well drained and having a moderate permeability with a K_{sat} value of 0.57 to 1.98 inches per hour. However significant cut and fill have occurred in the area since the soil survey was completed.

The seasonal mean high water table (SMHWT) level was determined using the NRCS method of observing the soils for redoxomorphic features as well as observing the local hydrology and the water levels in the borings.

PROPOSED CONSTRUCTION

The proposed construction will consist of an infiltration pond. The bottom of the rain pond is recommended to extend through the surficial clayey soils at the bottom of the existing pond to a depth of approximately 3 feet at the pond bottom or 6 to 8 feet below existing grade. Drainage swales are recommended to intercept surface water above the pond.

SOIL CONDITIONS

The soil borings indicated that the soil conditions vary across the site with regard to soil types. The soil conditions and test results for the boring in the stormwater infiltration pond location are noted below.

TEST RESULTS AT BORING G-7 Visual classification does not confirm the classification of Cecil Sandy Clay Loam at the bottom of the existing pond. The soil consists of Silt y Clay FILL with Fine Sand and Mica to a depth of 3-4 feet or greater in the bottom of the pond. At about 8 feet below grade in Boring G-7 natural sandy alluvial soils

Permeability (Hydraulic Conductivity) Rate estimated from grain size analysis =

Boring G-7 at 120 inches $k = 2.3 \times 10^{-4}$ cm/sec or 0.3 inches/hr

Note: Because there is generally some soil structure which provides secondary permeability pathways slightly higher rates of permeability than those estimated by grain size are recommended.

EVALUATION AND RECOMMENDATIONS

Seasonal Mean High Water Table (SMHWT)

Based on our field observations the seasonal mean high water table (SMHWT) level was determined using the NRCS method of observing the soils for redoxomorphic features as well as observing the local hydrology and the water levels in the borings.

Based on these observations the SMHWT levels at the site of the infiltration basin is approximately 5 to 7 feet below the bottom of the existing basin.

Recommended Permeability and Infiltration Rates

Based on our borings, the soil types and our testing of the soils we recommend the following Infiltration rate be used.

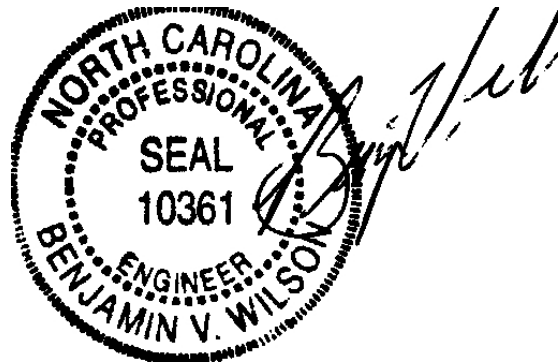
- *Use an infiltration rate of 0.8 inches/hour*

We have enjoyed working with you on this project. If you have any questions please do not hesitate to contact us.

Respectfully,
ATC Associates of North Carolina, P.C.



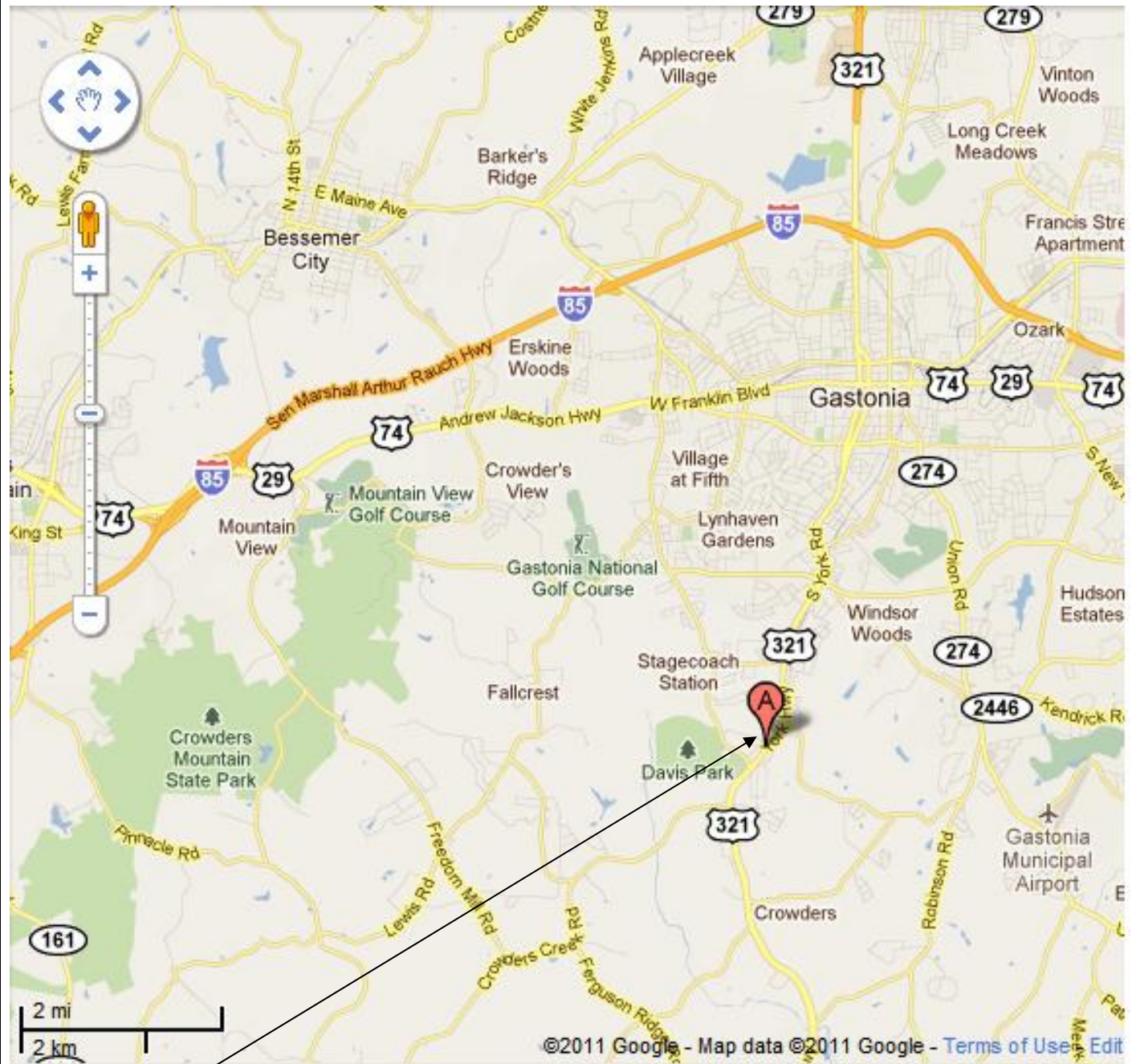
Herbert L. "Tooie" Hales II, P.E.
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Principal Engineer
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ATTACHMENTS

**Maps and Location Diagrams
Boring Log G-7
Soil Information
Test Results**



SITE - SOURCE: Google

SITE LOCATION

Subsurface Exploration Services
 Proposed Dollar General
 South Gastonia, North Carolina

ATC PROJECT NO.
 45.27739.0056
 SCALE: NOTED





SITE AERIAL WITH APPROXIMATE BORING LOCATIONS



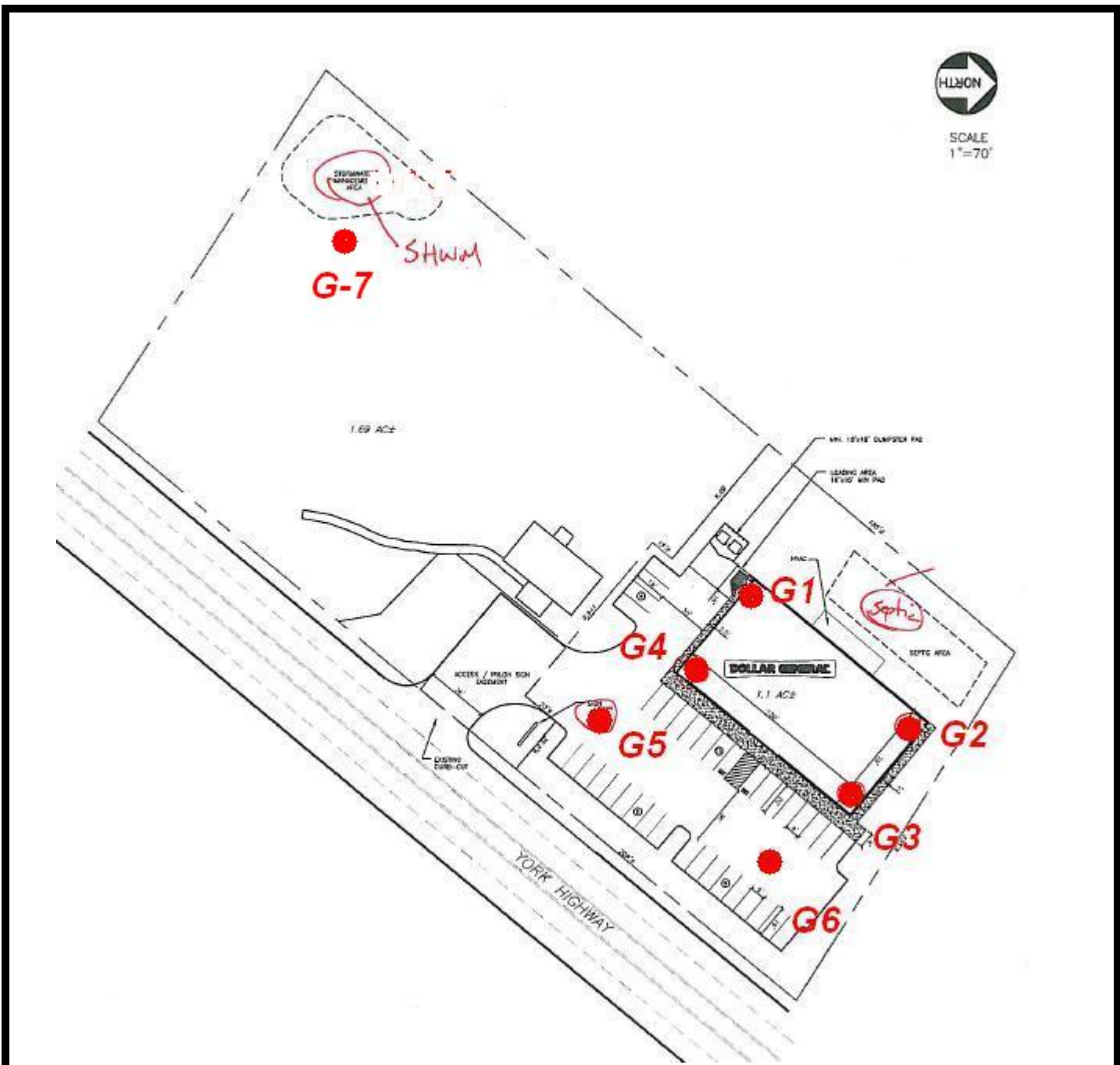
SOURCE: Gaston County GIS Aerial Photo

SITE AERIAL PHOTO

Subsurface Exploration Services
Proposed Dollar General
South Gastonia, North Carolina

ATC PROJECT NO.
45.27739.0056
SCALE: NOTED





PROPOSED SITE LAYOUT AND BORING LOCATIONS

SOURCE: Primax Properties

SITE LAYOUT
 Subsurface Exploration Services
 Proposed Dollar General
 South Gastonia, North Carolina

ATC PROJECT NO.
 45.27739.0056
 SCALE: NOTED





SITE TOPO - PRIOR TO SITE GRADING FOR SALES LOT FROM USGS

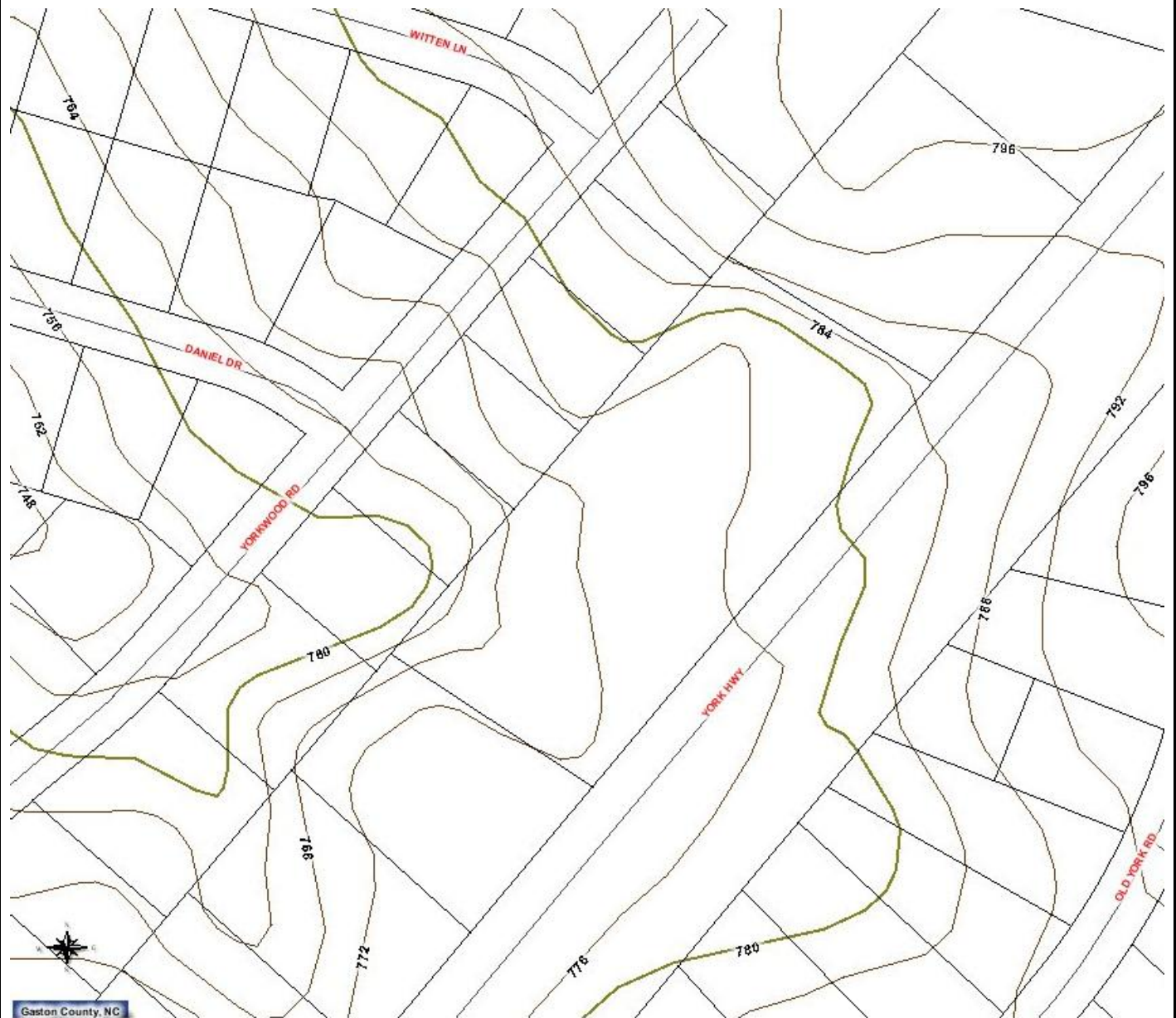
SOURCE: National Map Viewer

SITE TOPO

Subsurface Exploration Services
 Proposed Dollar General
 South Gastonia, North Carolina

ATC PROJECT NO.
 45.27739.0056
 SCALE: NOTED





**SITE TOPO - AFTER TO SITE GRADING FOR SALES LOT
FROM GASTON CO GIS**

Contours = 4 feet

SOURCE: Gaston County GIS

SITE TOPO

Subsurface Exploration Services
Proposed Dollar General
South Gastonia, North Carolina

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SCALE: NOTED





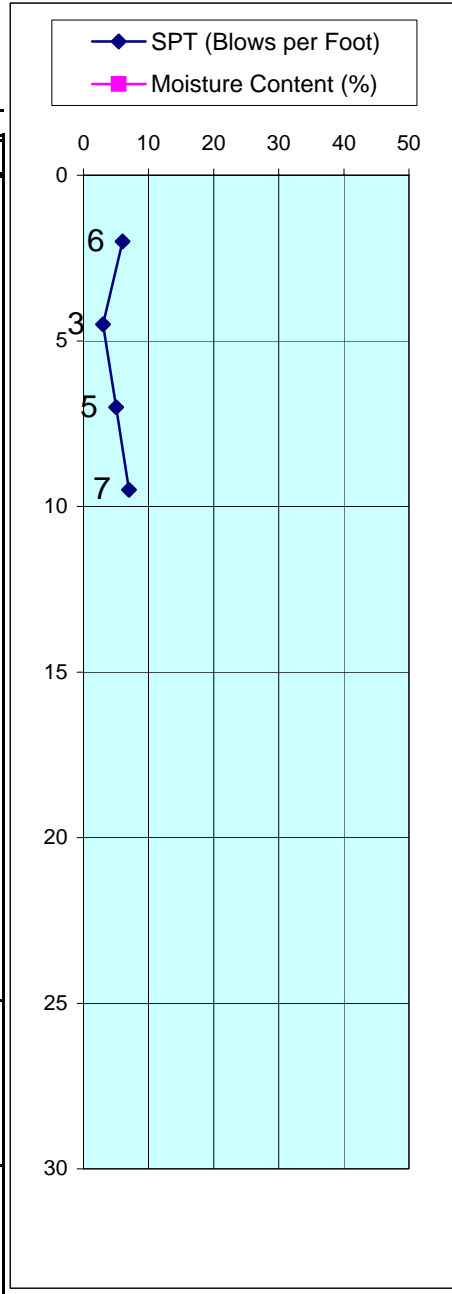
ATC Associates of North Carolina, PC

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LOG OF BORING
G-7

Project Name: Dollar General **ATC Project # :** 45.27739.0056
Project Location: South Gastonia, NC **Engineer:** BVW
Client: PRIMAX

Depth (Ft)	Elev. (Ft)	Sample Number	SAMPLE DESCRIPTION	Depth Change (Ft)
0			1.0 inch gravel	0.1
5		1	CLAYEY SILT, Trace Mica Red Brown and Brown, Medium Stiff (ML) Note: FILL	8.0
		2		
		3		
10		4	SILTY SAND, Some Clay and Mica Brown and Grey, Loose Wet, (SM)	
			Boring Terminated at 10.0 Feet Hollow Stem Auger Used Full Depth	
15		5		
20		6		
25		7		
30				



Water Level & Lab Test Results

Dry Cave in 7.0 ft at 4 hrs

Wet soil at 9 ft

Date Started: 7/27/2011 Drilling Method: Hollow Stem Auger
 Date Completed: 7/27/2011 Sampling Method: Split Spoon
 Driller: J&L Page: 1 of 1

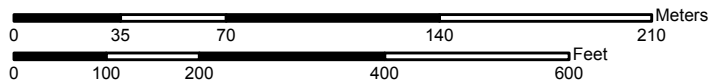
Soil Map—Gaston County, North Carolina
(South Gastonia)



81° 12' 22"



Map Scale: 1:2,580 if printed on A size (8.5" x 11") sheet.




81° 12' 1"

Soil Map—Gaston County, North Carolina
(South Gastonia)

MAP LEGEND






















Area of Interest (AOI)




 Area of Interest (AOI)

Soils




 Soil Map Units

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot

-  Very Stony Spot
-  Wet Spot
-  Other


Special Line Features

-  Gully
-  Short Steep Slope
-  Other






Political Features

-  Cities

Water Features

-  Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

MAP INFORMATION

Map Scale: 1:2,580 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 17N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Gaston County, North Carolina
Survey Area Data: Version 12, Jun 17, 2009

Date(s) aerial images were photographed: 7/19/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Gaston County, North Carolina (NC071)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CeD2	Cecil sandy clay loam, 8 to 15 percent slopes, moderately eroded	3.5	10.3%
CfB	Cecil-Urban land complex, 2 to 8 percent slopes	27.0	79.6%
CfD	Cecil-Urban land complex, 8 to 15 percent slopes	0.4	1.3%
MaB2	Madison sandy clay loam, 2 to 8 percent slopes, moderately eroded	3.0	8.8%
Totals for Area of Interest		33.9	100.0%

Gaston County, North Carolina

CeD2—Cecil sandy clay loam, 8 to 15 percent slopes, moderately eroded

Map Unit Setting

Elevation: 200 to 1,400 feet

Mean annual precipitation: 37 to 60 inches

Mean annual air temperature: 59 to 66 degrees F

Frost-free period: 200 to 240 days

Map Unit Composition

Cecil, moderately eroded, and similar soils: 85 percent

Description of Cecil, Moderately Eroded

Setting

Landform: Interfluves

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Saprolite derived from granite and gneiss and/or schist

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Moderate (about 8.3 inches)

Interpretive groups

Land capability (nonirrigated): 3e

Typical profile

0 to 6 inches: Sandy clay loam

6 to 40 inches: Clay

40 to 55 inches: Clay loam

55 to 80 inches: Sandy loam

Data Source Information

Soil Survey Area: Gaston County, North Carolina

Survey Area Data: Version 12, Jun 17, 2009



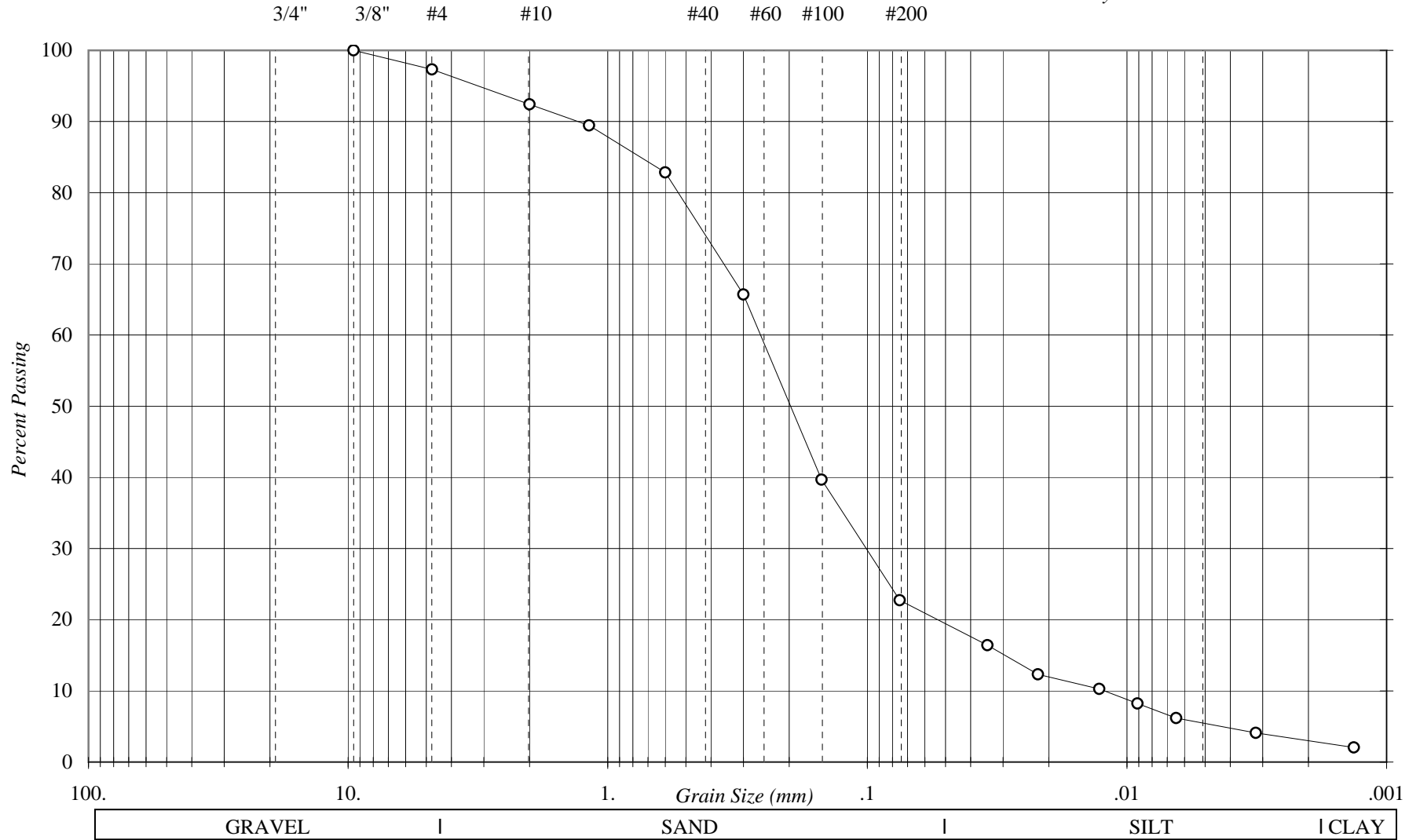
Grain Size Analysis

ATC Job No: 45.27739.0056

8/23/11

U. S. Standard Sieve Sizes

Hydrometer Data



Sample description: Brown SILTY SAND, Some Clay and Mica	% SAND = 77	LL =	ATC Job Name: Dollar General South Gastonia
U. S. C. S. Classification: SM	% FINES = 23	PI =	Sample No: S-4
		% Moisture 32.0%	Boring No: G-7