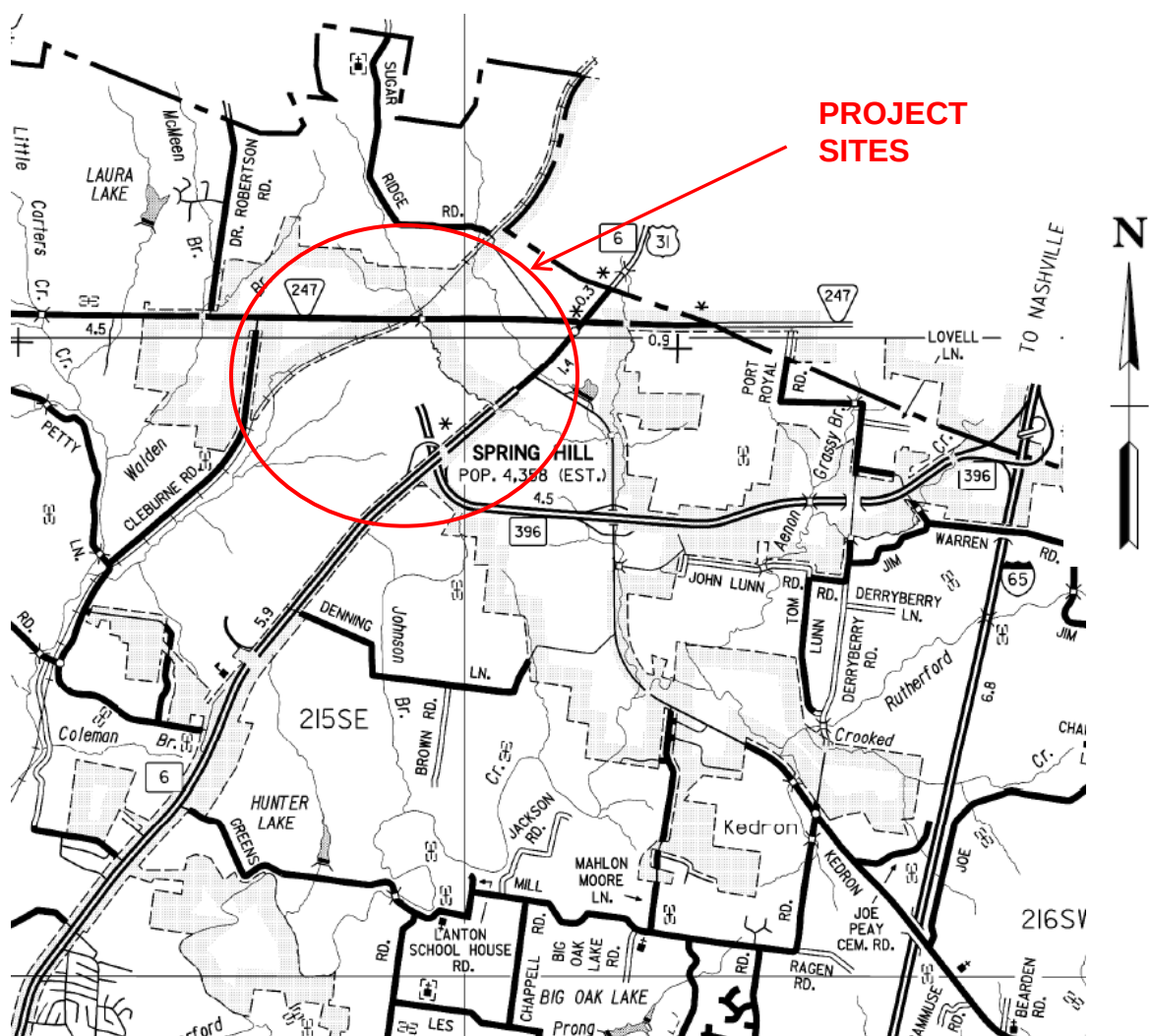


MAURY COUNTY



**PRELIMINARY GEOTECHNICAL REPORT
DESIGN-BUILD GEOTECHNICAL STUDY
PROJECT TRIPLE CROWN
SATURN PARKWAY EXTENSION
FROM SATURN PARKWAY (STATE ROUTE 396) TO BEEHCROFT ROAD (STATE ROUTE 247)
PROJECT NO. 60100-1209-04
PIN NO. 123399.00
MAURY COUNTY**

Executive Summary

The Geotechnical Engineering Section (GES) has completed a preliminary site investigation and literature review for the referenced design-build project.

Saturn Parkway (SR-396) connects Interstate 65 to the General Motors Spring Hill manufacturing plant (GM Plant). It currently terminates at the GM Plant, providing access to both truck traffic and employees. Located to the north of the GM Plant along Beechcroft Road (SR-247) are industries that receive deliveries from the Interstate and provide deliveries to the GM plant. The current route to access these industries uses local routes in a commercially developed area. Creating a direct route from Saturn Parkway to Beechcroft Road will reduce travel time for trucks moving through the area.

This new route will provide direct connectivity from existing Saturn Parkway (SR-396) to Beechcroft Road (SR-247) and provide access to the GM Plant. This project will provide a new signalized intersection at the entrance for trucks to the GM Plant and maintain free flow access to the employee parking area. Beechcroft Road to Saturn Parkway will become a free flow movement and existing Beechcroft Road to the east of the project will tie into the route at a stop controlled intersection. This project will also provide a new grade-separated railroad crossing over the CSX rail on Beechcroft Road. The Saturn Parkway Extension project will be incorporated into a design-build project which includes two projects that were already under development: a Road Safety Audit Report (RSAR) for intersection improvements at Cleburne Road and Beechcroft Road (PIN 117319.01) and the Project Shotgun State Industrial Access (SIA) that provides widening on Beechcroft Road and intersection improvements at two locations (PIN 121394.00).

The literature review included published geologic and topographic maps and a geotechnical report prepared by TDOT for previous improvements for the State Route 247 (Beechcroft Road) intersection at Cleburne Road in Spring Hill. The relevant geotechnical report is included in this report as an attachment.

In summary, there are no geotechnical and/or geologic conditions along the alignment that would restrict the implementation of the improvements. A thorough geotechnical investigation will be required prior to final design. For guidance refer to the TDOT Geotechnical Manual dated October 15, 2016 (<http://tn.gov/assets/entities/tdot/attachments/2016-10-15-TDOTGeotechManual.pdf>). This document and the attached geotechnical report are being provided for informational purposes only and should be sufficient information for the design-build teams to determine what amount of additional geotechnical information would be required to design the geotechnical aspects of the project.

**PRELIMINARY GEOTECHNICAL REPORT
DESIGN-BUILD GEOTECHNICAL STUDY
PROJECT TRIPLE CROWN
SATURN PARKWAY EXTENSION
FROM SATURN PARKWAY (STATE ROUTE 396) TO BEEHCROFT ROAD (STATE ROUTE 247)
PROJECT NO. 60100-1209-04
PIN NO. 123399.00
MAURY COUNTY**

Introduction

The Geotechnical Engineering Section (GES) has completed a preliminary site investigation and literature review for the referenced design-build project.

Saturn Parkway (SR-396) connects Interstate 65 to the General Motors Spring Hill manufacturing plant (GM Plant). It currently terminates at the GM Plant, providing access to both truck traffic and employees. Located to the north of the GM Plant along Beehcroft Road (SR-247) are industries that receive deliveries from the Interstate and provide deliveries to the GM plant. The current route to access these industries uses local routes in a commercially developed area. Creating a direct route from Saturn Parkway to Beehcroft Road will reduce travel time for trucks moving through the area.

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Geology, Soils, and Site Conditions

This project is located in Spring Hill, TN in Maury County near the Williamson County border. The project is within the physiographic region of Tennessee known as the Central Basin. The topography of the surrounding area is moderately rolling through pastures with some commercial, industrial, and residential development.

Available geologic mapping indicates the site is underlain by the Leipers and Catheys Formations, Bigby-Cannon Limestone Formation, and the Hermitage Formation representing the Ordovician Period.

Previous Geotechnical Report In The Project Area

A geotechnical report was prepared by TDOT for previous improvements for the State Route 247 (Beechcroft Road) intersection at Cleburne Road in Spring Hill. The relevant geotechnical report is included in this report as an attachment. This report is being provided for informational purposes only and does not provide a complete geotechnical assessment of the project area. This report and the attached information should be sufficient information for the design-build teams to determine what amount of additional geotechnical information would be required to design the geotechnical aspects of the project. A thorough geotechnical investigation will be required prior to final design. For guidance refer to the TDOT Geotechnical Manual dated October 15, 2016 (<http://tn.gov/assets/entities/tdot/attachments/2016-10-15-TDOTGeotechManual.pdf>).

Site Visit

A site visit was conducted on December 14, 2016. There are no geotechnical and/or geologic conditions along the alignment that would restrict the implementation of the improvements. In general, drilling is recommended approximately every 400 feet to a depth of approximately 20 feet. For additional guidance, refer to Section 2, Chapter 2.2 of the TDOT Geotechnical Manual, dated October 15, 2016.

Some items of note include the following:

- Two bridges crossing McCormack Branch. Additional drilling is recommended for this area. For additional guidance, refer to Section 1, Chapter 1.2 of the TDOT Geotechnical Manual, dated October 15, 2016. Section 1, Chapter 1.2 deals with general bridge projects.
- Grade separated crossing of railroad tracks. Additional drilling is recommended for this area in conjunction with the remainder of the alignment. For additional guidance, refer to Section 2, Chapter 2.2 and Chapter 2.4 of the TDOT Geotechnical Manual, dated October 15, 2016. Section 2, Chapter 2.2 deals with roadway alignment projects. Section 2, Chapter 2.4 deals with State Industrial Access (SIA) projects.
- A wet weather conveyance was noted from Station 125+00 to 130+00 parallel to and South of Beechcroft Road.

Drilling requirements for the project will include standard auger borings to determine soil type with the collection of T-99 Proctors and CBR samples for embankment construction and slope stability analysis. Both undisturbed (Shelby Tubes) and split spoon (SPT) samples will be needed.

If you have any questions, comments, and/or concerns, please contact the Geotechnical Engineering Section.



Ginger Bennett, E.I.

Transportation Project Specialist



Travis W. Smith, P.E.

CE Manager 1

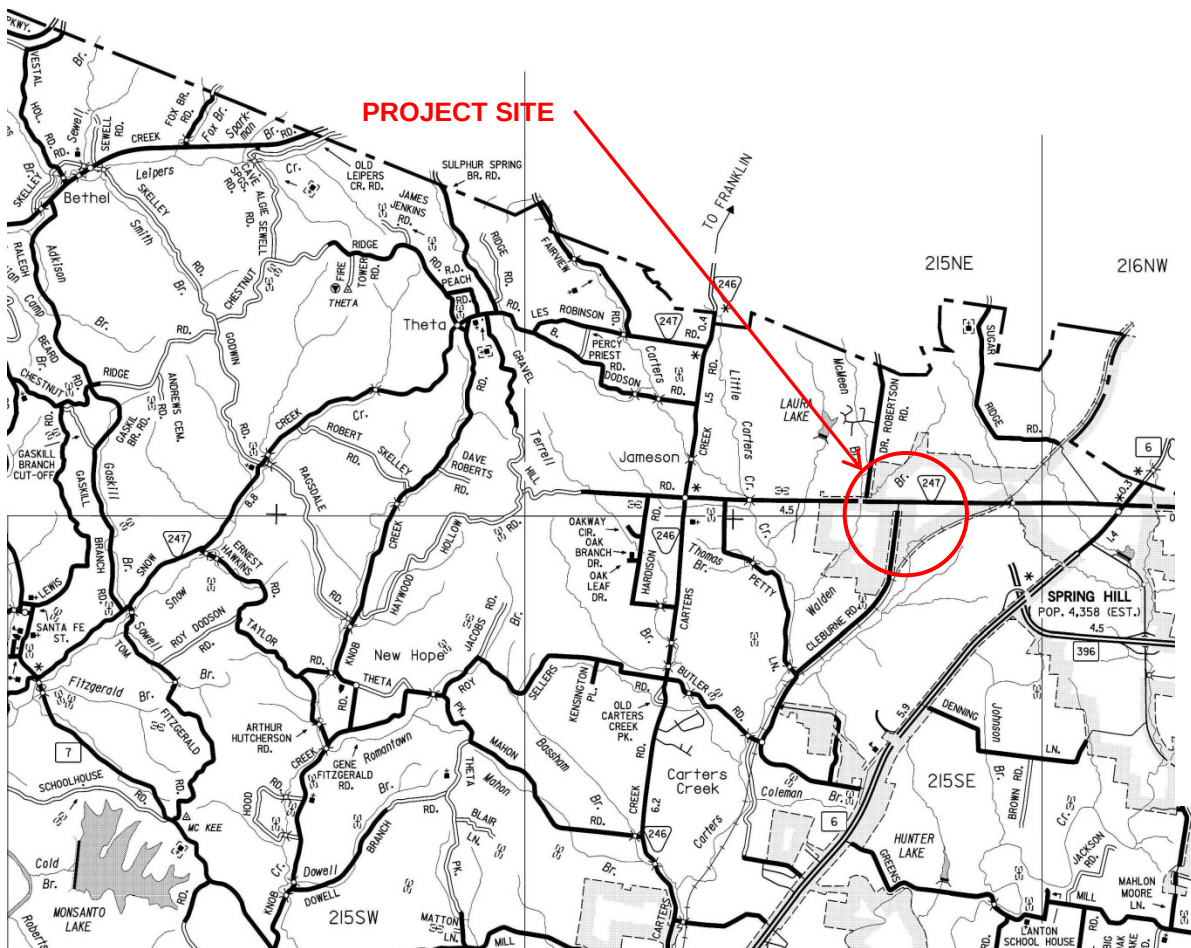
Attachment

GEOTECHNICAL ENGINEERING

DIVISION OF MATERIALS AND TESTS



SOILS AND GEOLOGY REPORT INTERSECTION IMPROVEMENT S.R. 247 (BEECHCROFT ROAD) AND CLEBURNE ROAD STATE PROJECT NO. 60019-1207-94 PIN NO. 117319.01 MAURY COUNTY



FILE NO. 6018414

SOILS AND GEOLOGY REPORT
Intersection Improvement
S.R. 247 (Beechcroft Road) and Cleburne Road
Project No. 60019-1207-94
Pin No. 117319.01
Maury County

EXECUTIVE SUMMARY

This report presents geotechnical recommendations for the State Route 247 (Beechcroft Road) intersection at Cleburne Road in Spring Hill. The proposed improvements will increase the sight distance by reducing the existing vertical curve east of the intersection. The improvements also include the additions of a left turn lane westbound and a right turn lane eastbound on S.R. 247, and the restructuring of the right turn lane from Cleburne Road onto S.R. 247. The total project length is 0.20 miles.

It is recommended to maintain cut and fill slopes of 3:1 or flatter as shown on the current cross sections. No drilling was accomplished for this project, therefore, recommendations are based on a field visit to the site, prior experience of the Geology in the area, and the plans and cross sections provided for this project. Construction will entail cuts and fills of 6 feet or less. A **CBR value of 7.0** is recommended for pavement design.

INTRODUCTION

This report presents geotechnical recommendations for a site investigation conducted to study the geologic setting and conditions for the intersection improvement at S.R. 247 (Beechcroft Road) and Cleburne Road. Improvements will be made by widening S.R. 247 to accommodate right and left turn lanes onto Cleburne Road and reducing the vertical curve east of the intersection. The total length of the improvement is 0.20 miles.

GEOLOGY, SOILS, AND SITE CONDITIONS

This project is located in the City of Spring Hill in a rural area of Maury County. The project is within the physiographic region of Tennessee known as the Central Basin. The topography of the surrounding area is moderately rolling through pastures with some commercial, industrial, and residential development.

Available geologic mapping indicates the site is underlain by the Leipers and Catheys Formations and Bigby-Cannon Limestone, representing the Ordovician Period. USDA Web Soil Survey indicates the area topsoil is composed of Mimosa silt loam and silty clay, and Braxton silt loam and silty clay.

SURFACE AND SUBSURFACE EXPLORATION

The surface of the entire project was examined. No subsurface exploration was performed. Small rock outcrops were loosely dispersed along the existing cut slopes of Beechcroft Road.

RECOMMENDATIONS AND DISCUSSION

SR 247 (Beechcroft Road): Station 11+75 to Station 23+00

This interval consists of predominately cut sections with cut depths up to 6 feet and minimal fills. Through this interval, the alignment ascends and descends a vertical curve that crests at Station 20+70. The proposed cuts through this interval lessen the vertical curve and improve site distance. It is recommended to maintain design slopes

with a maximum slope ratio of 3:1 for all slopes through this interval, with flatter slopes resulting in increased stability and decreased maintenance.

Cleburne Road: Station 20+00 to Station 24+25

This interval consists of predominantly cut sections, with cut depths less than 5 feet. It is recommended to maintain design slopes with a maximum slope ratio of 3:1 for all slopes through this interval, with flatter slopes resulting in increased stability and decreased maintenance.

CONSTRUCTION CONSIDERATIONS

Pre-benching of the existing fill slope prior to fill placement is required for all existing slopes steeper than 4:1, per TDOT Standard Specifications for Road and Bridge Construction, Section 205.03 – Preparation of Embankment Areas. Material excavated throughout this project shall be classified as **Transitional Material** as described under Section 4-203.02 (revised 12/15/14) of TDOT-Roadway Design Guidelines.

PAVEMENT DESIGN RECOMMENDATIONS

It is recommended that one continuous pavement section be designed using the county average **CBR value of 7.0**.

If there are any questions concerning this report, please contact the Geotechnical Engineering Section.



Frank Ponzio, E.I.T.
Transportation Project Specialist

TS:FP:CW
June 25, 2015



Travis W. Smith, P.E.
Civil Engineering Manager 1