



Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JIM BOXOLD
SECRETARY

ROADWAY DESIGN BULLETIN 15-04
MATERIALS BULLETIN 04-15
STRUCTURES DESIGN BULLETIN 15-02
ESTIMATES BULLETIN 15-03

(FHWA Approved: January 30, 2015)

DATE: February 6, 2015

TO: District Directors of Transportation Operations, District Directors of Transportation Development, District Design Engineers, District Consultant Project Management Engineers, District Construction Engineers, District Maintenance Engineers, District Geotechnical Engineers, District Structures Design Engineers, District Roadway Design Engineers, District Traffic Operations Engineers, Program Management Engineers

FROM: Michael Shepard, P. E., State Roadway Design Engineer
Timothy Ruelke, P.E., Director, Office of Materials
Robert V. Robertson, P.E., State Structures Design Engineer
Phillip "Greg" Davis, P.E., State Estimates Engineer

COPIES: Brian Blanchard, Tom Byron, Duane Brautigam, David Sadler, Tim Lattner, Trey Tillander, Mark Wilson, Bruce Dana, John Krause, Robert Robertson, Bob Crim, Rudy Powell, Greg Schiess, Nicholas Finch (FHWA), Jeffrey Ger (FHWA), Chad Thompson (FHWA), Phillip Bello (FHWA)

SUBJECT: **Protection of Existing Structures**

REQUIREMENTS

1. The following is a new chapter to be added in the *Plans Preparation Manual, Volume 1*. The chapter is located at the end of *Volume 1* titled: *Chapter 34 Protection of Existing Structures*, and reads as follows:

Chapter 34

PROTECTION OF EXISTING STRUCTURES

34.1 General

Protection of Existing Structures includes inspection and monitoring for vibration, settlement, and changes in groundwater level as described in **Section 108** of the **FDOT Specifications**.

34.2 Existing Structures

Existing structures to be protected include buildings, bridges, overhead sign and signal assemblies and retaining walls.

Existing structures also include sensitive sites, such as; Eye Surgery Clinics, Medical Centers, Hospitals, Geriatric Centers, Sound Recording Studios, TV/Radio Stations, Residences, Technical Laboratories, Antiques Shops, Museums, Historic Buildings and facilities with special equipment. Refer to sensitive sites noted in the Commitments section of the environmental clearance document if a PD&E Study has been conducted for the project.

34.3 Inspection and Settlement Monitoring

A registered Geotechnical Engineer and Structural Engineer may be required for the following evaluations when considering the type, use, condition and age of the existing structure and the geotechnical conditions.

34.3.1 Proposed Miscellaneous Structures

Evaluate the need for inspection and settlement monitoring of existing structures located within 25 feet of the limits of foundation construction for mast arm signal poles, strain poles, cantilever signs, overhead truss signs and high mast light poles.

34.3.2 Proposed Structures Other than Proposed Miscellaneous Structures

Evaluate the need for inspection and settlement monitoring of existing structures located within 250 feet of the limits of construction for proposed retaining walls, sheet pile and foundations for bridges and structures other than miscellaneous structures.

34.3.3 Proposed Vibratory Operations

Identify all existing structures that are within, and adjacent to, the project right of way that require inspection and settlement monitoring as a result of anticipated vibratory operations. Vibratory operations include pile driving, sheet pile and casing installation, and embankment and asphalt compaction.

Sensitive sites may require further direction to the Contractor through the use of a Project Note that:

- Imposes a more stringent vibration limit than the allowable 0.5 inches per second.
- Restricts hours of construction operations.
- Restricts the type of construction equipment to be used.

34.4 Groundwater Monitoring

Determine if piezometers are necessary to monitor groundwater when the project requires dewatering operations. Perform a dewatering analysis to evaluate the zone of influence of the groundwater drawdown. A registered Geotechnical Engineer may be required to assist with this evaluation.

34.5 Required Information in Contract Plans Set

Identify in the Plans existing structures that are recommended for inspection and settlement monitoring and provide information in the format shown in Table 34.5.1. on the Project Notes Sheet. Place sensitive site notes on the Project Notes Sheet.

Provide information for recommended piezometer installation necessary for groundwater monitoring in the format shown in Table 34.5.2 on the Project Notes Sheet.

Table 34.5.1 Recommendation for Protection of Existing Structures

Site No.	Address	Plan Sheet	Structure Type	Structure Usage	Recommendation
1	230 Walnut Street	46	Block	Storage Units	Perform groundwater monitoring during dewatering operations
2	N/A	46	Concrete	Bridge Culvert	Perform inspection and settlement monitoring during sheet pile installation
3	624 Oak Drive	47	Wood	Antique Shop	Perform vibration monitoring during milling and pavement operations

Table 34.5.2 Recommendation for Piezometer Installation

Site No.	Station	Offset	Depth	Note
P1	125+50	45' Rt	30'	Associated with Existing Structure Site No, 1

2. Include in the Contract Plans Set the pay items below as needed:

The following pay item is valid through 6-30-2015:

455-18 Protection of Existing Structures, LS

The following pay items are effective 7-1-2015:

108-1- Protection of Existing Structures –Inspection and Settlement Monitoring, LS/EA

108-2- Protection of Existing Structures –Vibration Monitoring, LS/EA

108-3- Protection of Existing Structures –Groundwater Monitoring, LS/EA

3. Section 9.2.4 of FDOT's *Soils and Foundations Handbook* is deleted and replaced with the following:

9.2.4 Existing Structures Survey and Evaluation

Structures in close proximity to construction activities should be evaluated for potential damages caused by these activities. The usage of the structures should also be included in this evaluation. This needs to happen early in the design process. Vibration, settlement, noise and any other damaging results of these construction activities should be considered in the evaluation. When warranted, the recommendations should include possible means of reducing the damaging effects of the construction activity, such as time restraints on certain operations, underpinning, monitoring, or even purchasing of the property.

Existing structures to be protected may include sensitive sites, such as those listed in PPM Chapter 34. The geotechnical design effort should evaluate these structures and confirm monitoring during construction is warranted based on the anticipated soil type, proximity and the proposed construction operations.

Use Tables 34.5.1 & 34.5.2 found in Chapter 34 of the Plans Preparation Manual to present your recommendations in the Geotechnical Report.

Where there is a potential impact on existing structures in the surrounding area, the report should include the structure's address, type of construction, the estimated vibration level that may cause damage, the usage (storage building, hospital, etc.), what the potential problem may be and what actions are recommended to minimize the impact.

Where construction dewatering may create a potential impact on existing structures in the surrounding area, the report should include the structure's address, type of construction, the degree of dewatering that may cause damage, the usage, what the potential problem may be and what actions are recommended to minimize the impact.

COMMENTARY

Existing structures on private property located near construction projects have been affected by construction activities such as roadway vibratory compaction, pile driving, excavation, and dewatering operations. Sensitive sites including Eye Surgery Clinics, Hospitals, Technical Laboratories and Historic Buildings require special consideration during construction. Lawsuits alleging damage to businesses and structures on private property have been costly to the Department.

Previously, **Section 455** of the **FDOT Specifications** included requirements for the Contractor to monitor and protect structures outside of the right of way that may be affected by the construction of foundations. A new Specification, **Section 108 Protection of Existing Structures**, includes additional requirements to monitor and/or protect structures that may be affected by vibration during roadway compaction and groundwater lowering during dewatering. This new Specification requires the Contractor to monitor and/or protect structures identified in the plans. Therefore, designers must identify sensitive sites and structures in the plans for the Contractor.

BACKGROUND

To provide the Contractor with the locations of sensitive sites and structures to be inspected and monitored, new requirements have been developed requiring these sites to be identified in the plans. A new **Plans Preparation Manual** chapter, **Volume 1 Chapter 34**, has been released to provide designers with requirements for identifying structures that may need protection and guidance on information needed in construction plans.

The new **Section 108** will be added to the **FDOT Specifications** to address protection of existing structures during any construction operation, including roadway compaction and other work that is not related to foundation construction. The subarticles in **Section 455** of the **FDOT Specifications** containing requirements for Protection of Existing Structures will be deleted.

IMPLEMENTATION

The Requirements of this bulletin are effective on all design-bid-build projects with LETTING dates on or after July 1st, 2015.

All of the Requirements of this bulletin are effective immediately on all Non-conventional projects for which the final RFP has not been released. Non-conventional projects for which the final RFP has been released are exempt from these requirements unless otherwise directed by the District.

Plans: For applicable projects, update the plans and Proposal Summary of Quantities (TRNS•PORT report).

Specifications: Specifications Package will be updated with the July 2015 Workbook.

Basis of Estimates Manual: The BOE has been updated to clarify the use of the new pay items in *Section 108* of the *FDOT Specifications*.

CONTACT

Paul Hiers, P.E.
Roadway Design Criteria Administrator
Florida Department of Transportation
605 Suwannee Street,
Tallahassee, FL 32399
Phone (850)-414-4324
Paul.Hiers@dot.state.fl.us

Larry Jones, P.E.
State Geotechnical Engineer
Florida Department of Transportation
605 Suwannee Street
Tallahassee, FL 32399
Office: (850) 414-4305
Larry.Jones@dot.state.fl.us

Melissa Hollis
Basis of Estimates Coordinator
Florida Department of Transportation
605 Suwannee Street
Tallahassee, FL 32399
Office: (850) 414-4182
melissa.hollis@dot.state.fl.us

PH/mj