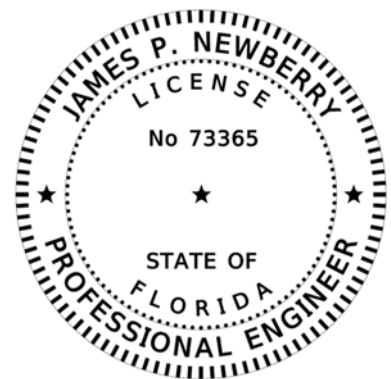


**TECHNICAL SPECIAL PROVISION**  
**FOR**  
**MONITORING OF EXISTING BRIDGES**  
FINANCIAL PROJECT ID: 429556-1-52-01

*This item has been digitally signed and sealed by James P. Newberry, PE, on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.*

Professional Engineer: James P. Newberry, PE  
Date: December 2<sup>nd</sup>, 2019  
Fla. License No.: 73365

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Certificate of Authorization: 29741  
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## **SECTION T108 –MONITORING OF EXISTING BRIDGES**

### **T108-1. GENERAL**

#### **T108-1.1. Description**

During construction of the replacement bridge, and while the existing bridge is open to traffic, monitor the existing bridge bascule piers for tilt and settlement. Adjust bascule span alignment as necessary, in accordance with this Technical Special Provision.

### **T108-2. MONITORING CRITERIA**

#### **T108-2.1. Specialty Engineer Qualifications**

Engage a Specialty Engineer from a firm prequalified with the Department in Movable Span Bridge Design (Work Type 4.4) to inspect the movable span support system, comprised of trunnion assemblies, live load shoe assemblies, and span lock assemblies, and provide a letter report summarizing their condition prior to construction. The Specialty Engineer shall be a professional engineer registered in the State of Florida.

#### **T108-2.2. Scope of Work**

Survey and monitor both existing bascule piers for settlement and tilt. Prior to construction, establish a benchmark on the Near Bascule Pier (control house side) for use in monitoring. Establish four physical targets on each bascule pier at deck level, one near each corner. Survey and record the location of each target relative to each other to an accuracy of  $\pm 0.001$  foot. Survey and record the elevation of all targets to an accuracy of  $\pm 0.001$  foot. Record the above data on a plan view for future reference.

Install a multi-axis tilt meter on each bascule pier capable of measuring tilt to the nearest 0.005 degrees. Continually measure multi-axis tilt from initial construction through removal of traffic from the existing bridge. Based on initial tilt measurements, establish limiting tilt criteria for triggering an alarm. Install telemetry equipment to automatically signal the Engineer in the event that tilt is observed which exceeds the established limiting tilt criteria.

Repeat surveys to measure the relative target locations following the driving of test piles at adjacent new piers. Repeat surveys monthly during pile driving at adjacent piers or in the event bascule span operational issues are observed or tilt sensors signal tilt exceeding the established limits. Operation issues are defined as difficulties in seating of the bascule leaves or difficulties in operating the span locks. In the event operational issues are observed, the Specialty Engineer shall reinspect the movable span support system, review the updated survey data, and prepare and submit to the Engineer a letter report identifying the cause of the operational issues and recommending corrective action.

#### **T108-2.3. Temporary Span Lock System**

Furnish a pair of temporary span locks that can be installed, adjusted, and operated in lieu of the existing span locks. Deliver and store the temporary span locks on site prior to construction. Install and operate the temporary span locks in the event the existing span locks cannot be operated due to settlement of the existing bridge, and existing span locks cannot be brought into alignment with normal adjustment. Adjust live load shoes in conjunction with temporary span lock installation and adjustment.

Provide temporary span lock design and calculations, including connections to the existing bridge structure, signed and sealed by the Specialty Engineer. Provide shop drawings for the temporary span locks and method of attachment to the existing bridge. Design and detail span locks for each lock to transfer a shear load of 35 kips (unfactored live load), plus 60% impact (dynamic load allowance) across the open joint between bascule leaves. Design and detail the span locks such that each lock can be installed and put into operation in a 8 hours or less.

Operate the temporary span locks and interlock the operation with the existing control system per the existing bridge operating procedures. Operation and interlocking may be automated or manually sequenced.

Temporary span locks shall not reduce width of existing lanes or shoulders.

**T108-3. METHOD OF MEASUREMENT**

All work associated with monitoring of the existing bridge, and designing, detailing, furnishing, installing, aligning, and adjusting temporary span locks, is considered incidental to work under Pay Item No. 108-1.

**T108-4. BASIS OF PAYMENT**

Price and payment will be full compensation for all work specified in this Technical Special Provision, including furnishing and installing all equipment and materials.

Payment will be made under:

Item No. 108- 1-	Monitor Existing Structures –	.....Lump Sum
	Inspection and Settlement Monitoring	