July 10, 2018

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

P.I. Number: 0011691
County: Henry

Section 103—Award and Execution of Contract

103.01 Consideration of Proposals

Delete the first sentence and substitute:

The bidder shall propose the number of Calendar Days to be allowed for the overall completion of the Contract (Site 00 – Complete Contract). The proposed number of Calendar Days shall be entered in the appropriate space in the Proposal. Proposals having no time entered will be considered non-responsive and will be rejected.

Each Proposal submitted shall consist of two parts:

(a) The correct sum of the products of the quantities shown in the Proposal multiplied by the Unit Prices Bid, and

(b) The total number of Calendar Days proposed by the bidder for completion of the Contract.

After the Proposals are opened and read, the successful low bid will then be determined by the Department as the lowest combination of (a) and (b) according to the following formula:

(a) + ((b) x (LD)) = Bid for bid comparison purposes only.

Where LD = Liquidated Damages for this project equals **$4,182/day**

The preceding formula will be used only to determine the successful low bidder and will not be used to determine the Contract award amount nor final payment to the Contractor when the Project is completed.

The bidder shall enter the number of Calendar Days bid in the Proposal under the following:

103-1000	Calendar Days (Contractor Bids Units)	DAYS

Georgia Department of Transportation

State of Georgia

Special Provision

P.I. No.: 0011691

County: Henry

Section 108 – PROSECUTION AND PROGRESS

Delete Section 108.07.E. and add the following:

108.07 Determination of Contract Time

E. Extension of Contract Time

1. Extension of the Contract Time will be granted ONLY for the following reasons:

a. The Work has been delayed by any act or omission of the Department. This includes suspension of The Work when the suspension in not the fault of the Contractor.
b. Supplemental Agreements affecting The Work that results in additional time being required to complete The Work affected by the modifications or alternations to the original Contract.
c. In the event of a catastrophic natural event (i.e., hurricane), or a declared state of emergency, that directly and substantially affects the Contractor's operations on the Project, the Department will extend the number of proposed days as per Special Provision 103.01 on a day for day basis commensurate with the number of days that the Engineer determines the Project was impacted.
d. The Work has been delayed by utilities and has followed the Escalation Process for Utility Delays During Construction as outlined in the Utility Accommodation Manual and a time extension is justified.

Request for extension of Contract Time shall be made in writing within 15 days after the start of such delay and shall state the reasons for the request and identify the specific days for which extension is requested.

July 10, 2018

Georgia Department of Transportation

State of Georgia

Special Provision

County: Henry

P.I. NO.: 0011691

SECTION 108 – PROSECUTION AND PROGRESS

Delete Section 108.08 and add the following:

108.08 Failure or Delay in Completing Work on Time

Time is an essential element of the Contract, and any delay in the prosecution of The Work may inconvenience the public, obstruct traffic, or interfere with business. In addition to the aforementioned inconveniences, any delay in completion of The Work will always increase the cost of engineering. For this reason, it is important that The Work be pressed vigorously to completion. Should the Contractor or, in case of default, the Surety fail to complete The Work within the time stipulated in the Contract or within such extra time that may be allowed, charges shall be assessed against any money due or that may become due the Contractor in the amount of **$4,182** per Calendar Day.

For each Calendar Day, that any work shall remain uncompleted after the contract time specified for the completion of The Work required by the Contract, the sum specified in the Contract will be deducted from any money due the Contractor, not as a penalty, but as liquidated damages; provided however, that due account shall be taken of any adjustment of the contract time for completion of the work granted under the provisions of Subsection 108.07.E.

The Department may waive such portions of the liquidated damages as may accrue after the work is in condition for safe and convenient use by the traveling public.

A. Liquidated Damages

The amount of such charges is hereby agreed upon as fixed liquidated damages due the Department after the expiration of the time for completion specified in the Contract. The Contractor and his Surety shall be liable for liquidated damages in excess of the amount due the Contractor on the final payment.

These fixed liquidated damages are not established as a penalty but are calculated and agreed upon in advance by the Department and the Contractor due the uncertainty and impossibility of making a determination as to the actual and consequential damages which are incurred by the Department, the State, and the general public as a result of the failure on the part of the Contractor to complete The Work on time.

3. **Deduction From Partial Payments:** Liquidated damages, as they accrue, will be deducted from periodic partial payments.
4. **Deduction From Final Payment:** The full amount of liquidated damages will be deducted from final payment to the Contractor and/or his Surety.
5. **No Liquidated Damages Charged for Delay by the Department:** In case of default of the Contract and the subsequent completion of The Work by the Department as hereinafter provided, the Contractor and his Surety shall be liable for the liquidated damages under the Contract, but no liquidated damages shall be chargeable for any delay in the final completion of The Work by the Department due to any unreasonable action, negligence, omission, or delay of the Department. In any suit for the collection of or involving the assessment of liquidated damages, the reasonableness of the amount shall be presumed. The liquidated damages referred to herein are intended to be and are cumulative and shall be in addition to every other remedy now or hereafter enforceable at law, in equity, by statute, or under the Contract.

B. No Waiver of Department's Right

Permitting the Contractor to continue and finish The Work or any part of it after the expiration of the time allowed for completion or after any extension of time, shall not operate as a waiver of the rights of the Department under the contract.

C: Intermediate Completion

For this project, the following item of work and corresponding intermediate time is required:

CR 661/Blackhall Road

1. CR 661/Blackhall Road traffic may be detoured for a maximum 60 Calendar Days. Time charges begin the day traffic is shifted to the detour and continued until the completion of all bridge work and roadway is reopened to safe and convenient use for the traveling public.

Failure to reopen the roadway in accordance with the above will result in the assessment of Liquidated Damages at the rate of $4,182 per Calendar Day or portion thereof.

D. Restrictive Work Hours

1. Failure to re-open travel lanes as specified in Special Provision 150.6.A result in the assessment of Liquidated Damages in the amount of $1,000 per hour or portion thereof.

E. Milled Surfaces:

1. Failure to cover milled surfaces as specified in Special Provision Section 150.6 will result in the assessment of liquidated damages in the amount of $1,000 per calendar day or portion thereof.

These rates are in addition to Liquidated Damages that may be assessed for failure to complete the overall project.

May 23, 2018

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO.: 0011691, HENRY COUNTY

P.I. NO.: 0011691

Section 150 — Traffic Control

Add the following to Subsection 150.6:

A. Lane Closures

1. The contractor shall not close lanes or move equipment or materials on the travel way of Blackhall Road that interferes with traffic between the hours of 6:00a.m. to 9:00 a.m. and 4:00 p.m. to 7:00 p.m. Monday through Friday.
2. The Contractor may close CR 661/Blackhall Road at Rum Creek for a maximum of 60 calendar days. Failure to reopen CR 661/Blackhall Road to traffic by the end of the specified time will result in the assessment of Liquidated Damages as listed in Special Provision 108.08.C.

Revised: March 15, 2017

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

Section 156— GPS Specifications for Conveyance Structures GIS Mapping

Delete Section 156 and substitute the following:

156.1 General Description

Perform the items of this work according to this Specification. This work includes:

- Collecting sub-meter locations and attributes for all stormwater structures, inlets, outlets, and conveyance means (excluding curb and gutter) within the project limits.
- Compiling, processing, and submitting the GIS data in accordance with the Department's policies and guidelines.
- Maintaining quality control and quality assurance while performing the work.

156.1.01 Definitions

General Provisions 101 through 150

156.1.02 Related References

A. Standard Specifications

General Provisions 101 through 150

B. Referenced Documents

GDOT Policy: 8075-1-Database Design and Modeling

GDOT Policy: 8075-5-Metadata Registry

GDOT Policy: 8085-1- Geospatial Data Policy

GDOT Policy: 8085-2- GPS Data Collection Policy

156.1.03 Submittals

General Provisions 101 through 150

156.2 Materials

General Provisions 101 through 150

156.3 Construction Requirements

General Provisions 101 through 150

156.3.01 Personnel

Furnish qualified personnel capable of performing the work in accordance with the Department's above-stated policies and procedures.

156.3.02 Accuracy

Ensure that data will be accurate within 1 yard (1 meter) horizontally for all assets. Collect and process data in accordance with the Department's Policies and Procedures.

156.3.03 Coordinate System

Submit the data to the Department in accordance with GDOT Policy 8085-1- Geospatial Data Policy and Standards.

156.3.04 Format

Provide data in ESRI ArcGIS 10.2 or newer file-based geodatabase format.

156.3.05 Schema and Metadata

Provide all the data in compliance with database schema, metadata, and required fields files located at the following URL: http://www.dot.ga.gov/PartnerSmart/DesignManuals/OtherResources/GIS_Inventory.zip

156.3.06 Data Submittal

The data shall be submitted to the Engineer no later than the final inspection. All electronic file deliverables shall include the PI number and "MS4" in the file name.

156.4 Measurement

This work will not be measured separately for payment.

156.5 Payment

This contract item completed and accepted will be paid at the Lump Sum Price bid, and the payment will be full compensation for all work completed as specified in this Section.

Payment will be made under:

Item No. 156	GPS Data Collection and Submittal	Per Lump Sum

Revised: October 19, 2017
First Use Date: April 8, 2011

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO.: 0011691, HENRY COUNTY

P.I. NO.: 0011691

Section 500 — Concrete Structures

Add the following to 500.1.03.A:

The Contractor is responsible for all concrete mix designs. Submit a mix design for approval to the Office of Materials and Testing. Include the sources, actual quantity of each ingredient, design slump, design air and laboratory results that demonstrate the ability of the design to attain the required compressive strength at 28 days.

Prepare and test at least 8 cylinders according to ASTM C192 and AASHTO T22 to ensure that the demonstrated laboratory compressive strength at 28 days exceeds the minimum acceptance Strength (X). Make the specimens from two or more separate batches with an equal number of cylinders made from each batch. The minimum acceptance strength is:

$$X = f'c + 500 \text{ psi } (X = f'c + 3.4 \text{ MPa})$$

Where, f'c is the required minimum compressive strength at 28 days for Class D concrete as shown in Table 1: Concrete Mix Table.

Add the following to 500.1.03.A:

Table 1—Concrete Mix Table

English								
Class of Concrete	**(2) Coarse Aggregate Size No.**	**(1 & 6) Minimum Cement Factor lbs/yd³**	**Max Water/ Cement Ratio lbs/lbs**	**(5) Slump Acceptance Limits (in) Lower - Upper**		**(3 & 7) Entrained Air Acceptance Limits (%) Lower - Upper**		**Minimum Compressive Strength at 28 days (psi)**
Class D	**57,67**	**650**	**0.445**	**2**	**4**	**3.5**	**7.0**	**4000**
Metric								

Class of Concrete	(2) Coarse Aggregate Size No.	(1 & 6) Minimum Cement Factor kg/m^3	Max Water/ Cement Ratio kg/kg	(5) Slump Acceptance Limits (mm) Lower - Upper		(3 & 7) Entrained Air Acceptance Limits (%) Lower - Upper		Minimum Compressive Strength at 28 days (MPa)
Class D	**57,67**	**386**	**0.445**	**50**	**100**	**3.5**	**7.0**	**28**

Delete Subsection 500.3.04.F.1.b.

Add the following to Subsection 500.3.04.F.1:

f. Class D-Bridge superstructure concrete or as called for on the Plans.

MATERIALS AND TESTING

Revised: January 18, 2018
First Use Date: January 18, 2018

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO.: 0011691, HENRY COUNTY

P.I. NO.: 0011691

Section 500—Concrete Structures

Add the following Subsections to Section 500:

500.1 General Description

This work includes furnishing ultra high performance concrete (UHPC) field cast joints to accelerate bridge construction.

500.1.02 Related References

A. Standard Specifications

Section 109—Measurement and Payment

500.1.03 Submittals

I. Ultra High Performance Concrete

1. Documented experience of manufacturing UHPC for at least five projects.

2. UHPC mix design in accordance with the material performance measures stated in this specification.

3. For UHPC mixed at the site, documentation of equipment meeting the UPHC Manufacturer's recommendations.

J. UHPC Pour Details

Provide details for placement of UHPC. Start placement of UHPC at the lowest pont of bridge and limit length of UHPC pours to a maximum of 10 feet horizontal.

500.2 Materials

Ensure that materials for Ultra High Performance Concrete (UHPC) meet the following Specifications:

The material shall be Ultra High Performance Concrete with all components supplied by one manufacturer. Materials commonly used in UHPC include: fine aggregate, cementious material, super plasticizer, accelerator and steel fibers (deformed, specifically made for steel reinforcement of concrete). The Contractor is responsible for UHPC mix design and ensure material meets:

Minimum Compressive Strength (ASTM C39)	
Heat-Treated*	$\geq$ 25 ksi
Not Heat-Treated	$\geq$ 21 ksi
Not Heat-Treated 4 day	$\geq$ 12 ksi
Prism Flexural Tensile toughness (ASTM C1018**, 10 in. span)	$I_{30} \geq 48$

Long-Term Shrinkage (ASTM C157; initial reading after set)	≤ 800 microstrain
Chloride Ion Penetrability (ASTM C1202)	≤ 250 coulombs
Chloride Ion Penetrability (AASTHO T259; 1/5 in. depth)	< 0.07 oz/ft^3
Scaling Resistance (ASTM C672)	y < 3
Abrasion Resistance (ASTM C944 2x weight; ground surface)	< 0.025 oz. lost
Freeze-Thaw Resisitance (ASTM C666A; 600 cycles)	RDM > 96%
Alkali-Silica Reaction (ASTM C1260; tested for 28 days)	Innocuous
* Heat-Treated – According to manufacturer's recommendation, temperature not to exceed 250°F ** This ASTM test has been discontinued. The Department continues to require it while options are explored for its replacement.	

Provide a UHPC mix design that contains steel fibers at a minimum of 2% by total volume of UHPC.

Provide certification of UHPC.

A minimum of 12 cylinders 3 in. X 6 in. shall be cast.

All cylinders shall be cured using the same method of curing proposed to be used in the field. The temperature during curing shall be within 18°F of the low end of the proposed temperature range for curing in the field. Test 2 cylinders each testing day. Test at 4 days, 7 days, 14 days and 28 days. Measure compressive strength in accordance with ASTM C39. Compressive strength shall meet 12 ksi minimum at 4 days and 21 ksi minimum at 28 days. Only a UHPC mix design that passes these test may be used in the work.

Cast 6 additional cylinders 12 in. diameter and 7½ in. deep. Each cylinder shall have one 32 in. long epoxy-coated reinforcing bar cast in the center of the circular face. The axis of the bar shall be perpendicular to the finished surface. Three (3) of the bars shall be #6 bars embedded 5 inches deep and 3 of the bars shall be #4 bars embedded 3 inches deep. Keep cylinders wet for 4 days prior to testing. Perform test as soon as practical once samples have reached a minimum compressive strength of 12 ksi. This test is a pullout test. The samples pass if the bars yield without the UHPC failing and without the bars pulling out of UHPC.

Results of these tests shall be conducted by a GDOT approved testing firm. Submit results for review and approval to the Engineer a minimum of 60 days prior to use of UHPC in the field.

500.3 Construction Requirements

500.3.01 Personnel

A. Supervision, Personnel, and Skilled Workers

4. Provide a manufacturer's representative supplying the approved UHPC who is knowledgeable in the supply, mixing, delivery, placement and curing of UHPC material. This representative shall be on site during all placement of UHPC.

500.3.03 Preparation

A. Pre-Pour Meeting

Prior to the initial placement of the UHPC, conduct an on site meeting with a manufacturer's representative supplying the approved UHPC and the Engineer. The objective of the meeting will be to clearly outline the procedures for mixing, transporting, finishing and curing of the UHPC material.

500.3.05 Construction

AM. Form Work, Batching and Curing

The design and fabrication of forms shall follow approved shop drawings and shall follow recommendations of the manufacturer. All forms for UHPC shall be constructed from plywood unless otherwise shown in the plans. The forms shall be coated to prevent absorption of water. Provide water tightness of forms to prevent loss of UHPC during pours.

Follow batching sequence as specified by the supplier and approved by the Engineer. The surface of UHPC field joints shall be filled flush to plus 1/4 in. above surface of bridge deck.

Cure UHPC in form according to Manufacturer's recommendations and as approved by the Engineer to attain 28 day strength listed herein. A continuous curing temperature of a minimum of 60°F is recommended.

500.3.06 Quality Acceptance

A. UHPC

Measure the slump flow on each batch of UHPC. The slump flow will be conducted using a mini-slump cone. The flow for each batch shall be between 7 in. and 10 in. Record slump flow for each batch and submit to the Engineer.

Make four sets of compressive strength test samples for each day of placement. Each set consists of 3 cylinders 3 in. X 6 in. Cure all cylinders in an environment similar to material placed and approved by the Engineer. Test the first set of cylinders as directed by the Engineer. Test second set of cylinders at 28 days. The third set of cylinders will be submitted to GDOT Office of Materials and Testing between the 4th day and the 14th day. The fourth set will be treated as a reserve set.

500.5 Payment

This Work will be paid for at the Contract Price per Lump Sum, complete in place and accepted.

Payment is full compensation for all things, including incidentals, and direct and indirect cost, to complete the Work.

Payment will be made under:

Item No.	Item	Payment
500	Ultra High Performance Concrete, Br No -	Per lump sum

Revised: January 18, 2018
First Use Date: January 18, 2018

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO.: 0011691, HENRY COUNTY

P.I. NO.: 0011691

Section 507—Prestressed Concrete Bridge Members

Delete Sub-Section 507.5.01 and substitute the following:

507.5.01 Adjustments

Upon completion of the erection in its manner and position in the temporary work area, 95 percent of the Contract Price will be paid on the next statement. The temporary work area may be located within the project limits as indicated on the Plans or some other location selected by the Contractor.

If there is no field rubbing or painting required, the 95 percent may be increased to 100 percent of the Contract Price. If this work is required, the remaining 5 percent will be included on the next statement after the Contractor satisfactorily completes the work.

Date: June 5, 2015
First Use Date: August 1, 2013

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
SPECIAL PROVISION

PROJECT NO. 0011691, HENRY COUNTY

P.I. NO. 0011691

Section 511 – Reinforcement Steel

Add the following to 511.2 Materials, B. Fabrication:

2. **Reinforcement Steel Couplers.** When couplers are indicated on the Plans, use mechanical butt splices from an approved source listed on QPL 93.

   Provide mechanical butt splices which develop a minimum of 125% of the guaranteed yield strength of the reinforcing steel to be spliced. Limit the total slip of the reinforcing bars within the splice sleeve after loading to 30 kips per square inch (207 MPa) and relaxing to 3 kips per square inch (21 MPa) to no more than the following, as measured between gauge points clear of the splice sleeve: 0.010 of an inch (.25mm) for reinforcing bars no. 14 (43) or smaller, or 0.030 of an inch (.76mm) for reinforcing bars no. 18 (57).

   Prior to installation on GDOT projects, the contractor is required to submit job-control samples for testing to the Office of Materials and Testing. This is to ensure that the installer is qualified to construct the units. Make test specimens in the presence of the Engineer or his authorized representative using reinforcing steel consigned for the work. A test specimen consists of a splice made at the job site to connect two 24 inch (600mm) or longer bars using the same splice materials, position, location, and equipment, and following the same procedures to be used to make splices in the work. Prior to incorporating couplers into the work, make and test three specimens that meet the above criteria.

   Perform all testing required above by the Office of Materials and Testing or at a testing laboratory approved by the Department.

   If threaded couplers are used, equip them with approved devices which will prevent rotation after installation.

   After installation, clean all couplers with a power wire brush or by other approved methods and recoat the couplers with a material prepared and recommended by the coating manufacturer.

   Install the couplers in strict accordance with the manufacturer's instructions and as approved by the Engineer.

   All costs for the couplers, test samples (including reinforcing steel for tests) and testing of couplers shall be included in the costs of reinforcing steel.

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

Henry County
P.I. NO. 0011691

SECTION 520—PILING

Delete Sub-Section 520.3.05.D.1 and substitute the following:

520.3.05.D.1. Determine Driving Resistance
Drive piles in one continuous operation. Determine the driving resistance of the piling based on the method specified in the plans, which will be one of the following methods (a – c):

a. Upon completion of the dynamic pile testing in accordance with Special Provision Section 523. The pile bearing will be determined by computing the penetration per blow with less than ¼-inch (6-mm) rebound averaged through 12 inches (305 mm) each of penetration. When it is considered necessary by the Engineer, the average penetration per blow may be determined by averaging the penetration per blow through the last 10 to 20 blows of the hammer. In soft material the driving resistance may be determined, at the Engineer's discretion, after delaying driving operations and performing pile re-strikes.

b. Upon completion of the loading test in accordance with Sub-Section 520.3.05.D.2.

c. Shall not be used when driving pile to hard rock. Using FHWA-modified Gates Formula as provided below:

$R_{ndr} = 1.75\ (E_d)^{0.5} \log_{10}\ (10N_b) - 100$ (kips) U.S units

$R_{ndr} = 7\ (E_d)^{0.5} \log_{10}\ (10N_b) - 550$ (kN) S.I. units

Where:

R_{ndr} = nominal pile driving resistance measured during pile driving

E_d = developed hammer energy. This is the kinetic energy in the ram at impact for a given blow. If ram velocity is not measured, it may be assumed equal to the potential energy of the ram at the height of the stroke, taken as the ram weight times the actual stroke (ft-lb for U.S units, kN-m for S.I. units)

N_b = Number of hammer blows for 1.0 inch of pile permanent set (blows/in)

These resistance formulas apply only when:

- The hammer has a free fall.
- The head of the pile is not broomed, crushed, spalled, or excessively crimped.
- The penetration rate is reasonably uniform.

Determining driving resistance by formula is not a Pay Item. Provide the facilities for determining driving resistance by formula as an incidental part of the work.

Once the driving resistance has been determined by one of the methods noted above, do not continue to drive piles if the Engineer determines that the piles have reached practical refusal. Practical refusal is defined as 20 blows per inch with the hammer operating at the highest setting or setting determined by the Engineer and less than ¼-inch (6-mm) rebound per blow. The Engineer will generally make this determination within 2 inches (51 mm) of driving. However, the Engineer will not approve the continuation of driving at practical refusal for more than 12 inches (305 mm). When the required pile penetration cannot be achieved by driving without exceeding practical refusal, use other penetration aids such as jetting, spudding, predrilling or other methods approved by the Engineer.

d. Wave Equation: Use the Wave Equation Analysis for Piles (WEAP) program to evaluate the suitability of the proposed driving system chosen from the methods noted above (including the hammer, follower, capblock and pile cushions) as well as to estimate the driving resistance to achieve the pile bearing requirements and to evaluate pile driving stresses. Use the WEAP program to show that the hammer is capable of driving to a driving resistance equal 130% (1.3 times) the driving resistance shown in the Plans without overstressing the piling in compression or tension and without reaching practical refusal.

Perform the WEAP analysis with personnel who are experienced in this type work, and have performed this analysis on a minimum of 15 projects. Provide a list of the qualifications and experience of the personnel to perform the WEAP analysis for this Project.

The Engineer may modify the scour resistance shown in the plans if the dynamic pile test is used to determine the actual soil resistance through the scour zone. Also, the Engineer may make modifications in scour resistance when the Contractor proposes drilling and/or jetting to reduce the soil resistance in the scour zone.

A minimum of two weeks prior to beginning any pile driving operations, submit to the Engineer for evaluation and approval the following information on all of the proposed pile driving system(s) to be used on the Project including but not limited to:

i. Items on Pile Driving Equipment Data Sheet
ii. Other information on the driving system required by the Engineer

iii. A WEAP program output indicating the approximate depth or elevation where the pile will achieve the bearing required
iv. Valid Driving Criteria.

Valid driving criteria is defined as having the required hammer having a hammer set greater than 3 blows per inch and less than 10 blows per inch at the driving resistance for that pile.

If WEAP analyses show that the hammer(s) will overstress the pile, modify the driving system or method of operation as required to prevent overstressing the pile. Resubmit the modified pile driving system information and WEAP program output to the Engineer for re-evaluation. Do not begin pile driving operations until the Engineer has approved the qualifications of the personnel, the WEAP program output, and the pile driving system(s).

Approval of the pile driving system(s) is also based on satisfactory field trials with dynamic pile testing. Obtain approval from the Engineer for the pile driving system(s) based on satisfactory field performance.

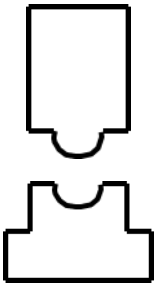
If piles require different hammer sizes, the Contractor may elect to drive with more than one size hammer or with a variable energy hammer, provided that the hammer is properly sized and cushioned, will not damage the pile, and will develop the required resistance.

For penetration of weak soils by concrete piles, use thick cushions and/or reduced stroke to control tension stresses during driving.

Pile Driving Data Form

Contract ID:
PI Number:
County

Structure Name:
Structure No.:
Pile Driving Contractor:



Hammer

Manufacturer: _____ Model No. _____
Hammer Type: _____ Serial No. _____
Manufacturers Maximum Rated Energy: _____(ft-k)
Stroke at Maximum Rated Energy: _____(ft)
Range in Operating Energy: _____ to _____(ft-k)
Range in Operating Stroke: _____ to _____(ft)
Ram Weight: _____ (kips)
Modifications: _____

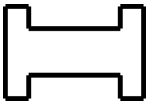
Striker Plate

Weight: _____(kips) Diameter: _____(in)
Thickness: _____(in)

Hammer Cushion

Material 1	Material 2
Name: _____	Name: _____
Area: _____(in^2)	Area: (in^2)
Thickness/Plate: _____(in)	Thickness/Plate:_____(in)
No. of Plates: _____	No. of Plates: _____

Total Thickness of Hammer Cushion: _____(in)

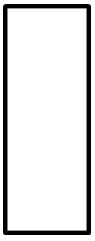


Helmet

Weight including inserts: _____(kips)

Pile Cushion

Material: _____
Area: _____(in^2) Thickness/Sheet: _____(in)
No. of Sheets: _____
Total Thickness of Pile Cushion: _____(in)



Pile

Pile Type: _____
Wall Thickness: _____(in) Taper: _____
Cross Sectional Area: ___(in^2) Weight/Meter: _____
Ordered Length: _____(ft)
Driving Resistance: _____(kips)
Description of Splice: _____
Driving Shoe/Closure Plate Description: _____

Submitted By: _____ Date: _____

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

Henry County
P.I. No. 0011691

SECTION 523 - DYNAMIC PILE TESTING

523.1 General Description

The work consists of performing dynamic pile testing using the Pile Driving Analyzer (PDA) to monitor the driving of piles with accelerometer and strain gauges attached to the piles. Piles to be dynamically tested will be identified in the Special Provision or on the Plans. Prior to pile driving, the Engineer will determine production or test piles to be dynamically tested. Perform the dynamic pile testing in accordance with ASTM D4945-12.

Take dynamic measurements during driving of any required piles. Drive the pile as shown in the Special Provisions or on the Plans.

523.2 Materials

Furnish measuring instruments for dynamic pile testing. Attach instruments near the top of the piles with bolts placed in drilled holes. Furnish materials, labor and equipment necessary for installation of the instruments.

523.3 Construction Requirements

Measure wave speed prior to driving piles. Wave speed measurements will not be required for Steel H piles or metal shell piles. When wave speed measurements are performed, place the piles in a horizontal position not in contact with other piles.

Perform dynamic pile testing during driving. Modify the driving to reduce the stress and/or eliminate the damage, should the recommended stress level be exceeded or if damage occurs (determined visually or as indicated by the instrumentation).

Do not exceed the following maximum driving stresses, as determined by the dynamic pile testing:

1. For Steel piles:

   0.9 Fy, where Fy = Yield strength of steel

2. For Prestressed Concrete Piles:
   <u>Compression:</u>

$$\sigma_{dr} = (0.85f'_c - f_{pe})$$

Tension in Normal Environments:

$$\sigma_{dr} = (0.095\sqrt{f'_c} + f_{pe})$$

Tension in Severe Corrosive Environments:

$$\sigma_{dr} = \varphi_{da} f_{pe}$$

where;
σ_{dr} = maximum allowed driving stress, ksi
$f'c$= specified minimum 28-day compressive strength of concrete, ksi
$f pe$= effective prestress in concrete, ksi, (after all losses) at the time of driving taken as 0.78 times the initial prestress force

Re-drive friction piles that do not obtain bearing after a freeze period of a minimum of 24 hours or for a period designated on the Plans, whichever is longer. Reset the gauges if required. Re-strike the pile with a warm hammer until a maximum penetration of 3 inches (76 mm) or 40 blows is reached, whichever occurs first. The Engineer may modify the Pile Driving Objective based on the results of the PDA work.

Provide two weeks' notice prior to the driving of designated piles and cooperate with the Engineer in connection with the performance of Dynamic Pile Testing.

Provide a complete report consisting of but not limited to PDA field monitoring data, results of CAPWAP computer analyses, and recommendations such as pile lengths, hammer fuel setting, and valid driving criteria. Valid driving criteria is defined as having the required hammer having a hammer set greater than 3 blows per inch and less than 10 blows per inch at the driving resistance for that pile. Submit the report electronically in PDF format and the electronic data files of the PDA analysis and CAPWAP to the Geotechnical Bureau and allow seven (7) calendar days for review and approval before proceeding with driving production piles.

523.4 Measurement

The Dynamic Pile Tests performed in accordance with these Specifications will be counted separately for payment. (Refer to plans summary sheet for the required amount of PDA testing.)

523.5 Payment

The Dynamic Pile Test completed and accepted will be paid for at the Contract unit Price. This payment will be full compensation for all costs of complying with this specification, including incidentals, additional work, and any delays incurred in conjunction therewith.

Payment will be made under:

Item No. 523. Dynamic Pile Test_____ . . . . . Per Each

Office of Materials and Testing

Revised: January 18, 2018
First Use Date: January 18, 2018

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO.: 0011691, HENRY COUNTY

P.I. NO.: 0011691

Section 999 — Composite Deck-Beam Units with Field Cast Joints

Add Section 999 as follows:

999.1 General Description

This work includes furnishing full depth composite deck- beam units with field cast joints to accelerate bridge construction.

999.1.1 Definitions

General Provisions 101 through 150.

999.1.2 Related References

A. Standard Specifications

Section 109—Measurement and Payment

Section 500—Concrete Structures

Section 511—Reinforcement Steel

Section 801—Fine Aggregate

Section 830—Portland Cement

Section 853—Reinforcement and Tensioning Steel

B. Referenced Documents

General Provisions 101 through 150.

999.1.3 Submittals

A. Erection Drawings

Submit erection drawings detailing the installation of composite deck-beam units and procedures for adjusting composite deck-beam units to fit the bridge deck profile shown in the plans. Provide installation tolerances for placement and adjustment of composite deck-beam units.

B. Temporary Supporting False Bents

Submit shop drawing installation of temporary supporting false bents at the minimum as below:

1. Foundation support system including piling, footings, caps, concrete, reinforcement, welding, etc., as applicable.
2. Plans and details indicating locations and layout of false bents, forms, and method of construction.

C. Accelerated Bridge Construction Schedule

Submit a detailed schedule for approval of the Engineer outlining construction operations from the time the road is closed to traffic until traffic is resumed. At a minimum, this schedule shall include the removal of existing bridge, construction of substructure, installation and adjustment of composite deck-beam units, installation of formwork, placement of end walls and edge beams and slab block-outs, placement of field cast joints, placement of concrete barrier, end post and barrier transition, grinding and grooving deck, grading, placement of approach slabs and pavement, installation of guardrail, and pavement marking.

999.2 Materials

Ensure materials meet the following Specifications:

Composite Deck-Beam Units

Construct composite deck-beam units in accordance with the plans and specifications.

999.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

999.3 Construction Requirements

999.3.1 Equipment

General Provisions 101 through 150.

999.3.2 Fabrication

General Provisions 101 through 150.

999.3.3 Construction

Construct composite deck-beam units with field cast joints in accordance with the plans, Specifications and approved installation procedures.

999.3.4 Quality Acceptance

A. Composite Deck-Beam Units

See Sub-Section 500.3.06 for Quality Acceptance.

999.3.5 Contractor Warranty and Maintenance

General Provisions 101 through 150.

999.4 Measurement

This work is measured for payment as an accepted Lump Sum quantity.

999.4.01 Limits

Measurement does not include the following items that will be paid for separately as indicated on the Plans:

- Prestressed concrete beams
- Superstructure reinforcement
- Superstructure concrete
- Structural steel diaphragms
- Twenty-four hour accelerated strength concrete

- Field cast joints
- Concrete barrier
- Grooved concrete

999.5 Payment

This Work will be paid for at the Lump Sum price for composite deck-beam units, complete in place and accepted for all applicable spans. Payment is full compensation for preparing drawings, furnishing the necessary equipment and performing the work including installation and removal of any false bents or supports, temporary bracing, transportation and handling of deck-beam units, erection, and installation of steel diaphragms.

Payment will be made under:

Item No.	Item	Payment
999	Composite Deck-Beam Units, Br No -	Per lump sum