Supplemental Specification
901-S-607
Construction Surveying

OFFICE OF STATE AID ROAD CONSTRUCTION

DATE: March 13, 2019

SUBJECT: Construction Surveying

The MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows: In the middle of page 6-39 remove " **Section S-607 – Blank.”** and add the following:

SECTION S-607 – CONSTRUCTION SURVEYING

S- 607.01—Description. This work consists of performing all calculations and other work necessary to establish and/or verify all horizontal and vertical control data; and furnishing, placing and maintaining roadway construction surveying and/or bridge, box bridge, or box culvert construction surveying, necessary for the proper prosecution of all features and items of the work under contract. This shall include, but not be limited to, grades and drainage structure locations, lengths, elevations and skews. When the contract includes a pay item for roadway construction surveying as provided herein, any references in other sections of the Standard Specifications to establishment of control points or construction surveying "by the Engineer", or “Engineer” or “County Engineer” shall be construed to mean "by the Contractor".

S-607.02--Materials. The Contractor shall furnish all personnel, materials, equipment and devices necessary for determining, establishing, setting, checking and maintaining points, lines, grades and layout of the work. All surveying equipment shall be properly adjusted and suited for performing the work required. Traffic control necessary for the proper execution of the work shall be furnished by the Contractor without separate measurement for payment. Stakes shall be of sufficient length, thickness and quality to serve the purpose for which they are being used. Nails, cotton picker spindles, rebar, wire flags or other materials may be used as appropriate to the purpose of marking and preserving layout locations as needed.

S-607.03--Construction Requirements.

S-607.03.1--General. The County Engineer will establish, one time only, secondary control points with elevations at distances not to exceed 1000 feet or that minimum distance necessary to maintain inter-visibility. For bridge work, the Engineer's field control will consist of a stationed baseline reference point near each end of the bridge(s) and one accessible bench mark near each bridge site. The Contractor shall verify the accuracy of the control points before proceeding with the layout for construction.

When errors are discovered and control points do not agree with the plans, the Contractor shall promptly notify the Engineer in writing, and explain the problem in detail. The Engineer will advise the Contractor within five (5) working days of any corrective actions that may be deemed necessary.

The Contractor will be responsible for verifying and modifying, as necessary to best fit existing field conditions, lengths, locations, elevations and skew angles of all drainage structures shown on the construction plans. All junction box and inlet locations and heights shall also be verified and modified as necessary to fit existing field conditions. Modifications to the plans shall not be made without the consent of the County Engineer. The Contractor will not be responsible for determining the size of drainage structures, but should immediately report any suspected error to the Engineer. Heights of fill over drainage structures shall be checked to verify class of pipe, bedding and the appropriate standard and/or modified standard drawing(s) required in the construction with any differences from the plans being reported to the Engineer.

The Contractor shall perform work necessary to verify alignment and plan grades on all roadway intersections and tie-ins. Any discrepancies in grades, alignment, location and or dimension detected by the Contractor shall immediately be brought to the attention of the Project Engineer.

The Contractor shall employ sufficient qualified personnel experienced in highway surveying and layout to complete the work accurately. The Contractor shall also determine and provide all additional grade controls and staking operations necessary to secure a correct layout and construction of the work. All minor variations in layout and grades required to meet field conditions shall be resolved with the Engineer and shall not be considered justification for adjusting contract price or time.
Examples of minor variations in layout and grades are:

(a) Adjustment of drainage or other structure length, alignment, and flow line elevation.
(b) The adjustment of grades and alignment at roadway intersections, cross-overs, railroad crossings, interchanges, existing bridges and roadways.
(c) Adjustment of curve data.

The Contractor will be responsible for calculating and laying out all additional lines, grades, elevations and dimensions necessary to construct the work required in the plans. All grades and other layout data computed by the Contractor shall be recorded and a copy of this data shall be furnished, with sufficient time for checking, to the Engineer before field work is started. The originals of all data shall be furnished to the Engineer on or before final inspection for the Engineer’s permanent file. The Contractor shall also furnish personnel to assist the Engineer in taking tolerance verification checks or other notes to determine whether specified tolerances are met. Any inspection or checking of the Contractor's layout by the Engineer and the approval of all or any part of it will not relieve the Contractor of the responsibility to secure proper dimensions, grades, and elevations of the several parts of the work.

Prior to beginning construction on any structure that references to an existing structure or topographical feature, the Contractor shall check the pertinent location and grades of the existing structures or topographical features to determine whether the location and grade shown on the plans are correct.

The Contractor shall stake centerline control at each station, BOP, EOP, PC, PT, SC, CS, TS, ST, and equations just before field cross sectioning by the Engineer for both original and final cross sections.

The Contractor shall furnish "as built" finish centerline elevations to the Engineer prior to final inspection of the project.

The Contractor shall set stakes and/or flags on the right-of-way line at each station and right-of-way break or as directed by the Engineer before clearing operations are started on any section of roadway.

The Contractor shall exercise care in the preservation of stakes and bench marks and shall reset them when they are damaged, lost, displaced or removed. The Contractor shall use competent personnel and suitable equipment for the layout work required and shall provide that it be performed under the supervision of, or directed by, a Registered Professional Engineer or Registered Land Surveyor who is duly registered and entitled to practice as a Professional Engineer or Professional Land Surveyor in the State of Mississippi. The duties performed by said Registrant shall conform to the definitions under the "practice of engineering" and practice of "land surveying" in Mississippi Law.

The Contractor shall not engage the services of any person in the employ of the Engineer for the performance of any of the work covered by this Section or any person who has been employed by the Engineer within the past six months except those who have legitimately retired during this period.
All cross sections, measurements, and tickets required for determining pay quantities will be the responsibility of the Engineer.

The Engineer reserves the right to check any or all of the Contractor's layout work for accuracy and shall be assisted by the Contractor's personnel in such checking. When errors or discrepancies are found, the Contractor will take measures necessary to correct, at no expense to the County or State, any construction that has been performed using the improper layout. Any inspection, checking and approval thereof by the Engineer of work for which the Contractor is responsible will not relieve the Contractor of responsibility to secure correct dimensions, grades, elevations, alignments and locations of the work for satisfactory completion of the project and as a condition for final acceptance by the Engineer.

S-607.03.2--Conventional Surveying. In addition to the requirements set forth in Subsection 607.03.1, the following shall be required when using the conventional staking method.

On grading projects, the Contractor shall set slope stakes at each station and at the beginning and end of curves. Closer intervals will be required for sharp changes in grades or alignment, widening and certain other geometric details.

The Contractor shall set subgrade blue tops on centerline, break points and at the left and right subgrade shoulder lines at intervals of not more than 100 feet on tangents and intervals of not more than 50 feet in curves. The Engineer may require closer intervals for sharp changes in grades or alignment, widening, or super elevation.

The Contractor shall furnish personnel to assist the Engineer in taking stringline and other notes to determine whether specified tolerances are met

On paving contracts, the Contractor shall set subgrade, base and paving blue tops. The base and pavement grade stakes shall be set on intervals in accordance with the requirement of the Engineer.

S-607.03.3--Automated Machine Guidance. In addition to the requirements set forth in Subsection 699.03.1, the Contractor may submit a request to use Automated Machine Guidance (AMG) equipment and methods to complete the work. A comprehensive written request shall be submitted to the Engineer for review at least 30 days prior to expected use. The Engineer will have to approve the submittal prior to the Contractor performing any AMG work.

The Engineer shall have final authority to approve or not allow the use of AMG equipment and methods under the specification.

S-607.04--Method of Measurement. Construction Surveying will be measured as a lump sum quantity. When Pay Item No. 607-A, Roadway Construction Surveying, is provided in the contract, measurement

shall include the staking of all bridges, box bridges and box culverts, including any detour bridges, or detour run arounds, which are a part of the contract.

S-607.04.1--Roadway Construction Surveying. Roadway Construction Surveying will be measured for payment in accordance with the following schedule:

(a) Monthly estimate # 1, 25 percent of the amount bid for Roadway Construction Surveying will be paid.
(b) Monthly estimate # 2, 50 percent of the amount bid for Roadway Construction Surveying will be paid.
(c) After the Contractor has earned 50 percent of the original value of all direct pay items, the amount paid on later monthly estimates will be based on the contract percent complete.

S-607.04.2—Bridge Construction Surveying. Bridge Construction Surveying will be measured for payment in accordance with the following schedule:

(a) Monthly estimate # 1, 35 percent of the amount bid for Bridge Construction Surveying will be paid.
(b) Monthly estimate # 2, 75 percent of the amount bid for Bridge Construction Surveying will be paid.
(c) After the Contractor has earned 75 percent of the original value of all direct pay items, the amount paid on later monthly estimates will be based on the contract percent complete.

S-607.05--Basis of Payment. Construction Surveying, measured as prescribed above, will be paid for at the contract lump sum price, which shall be full compensation for completing the work.

Payment will be made under:

S-607-A:	Roadway Construction Surveying	- lump sum
S-607-B:	Bridge Construction Surveying	- lump sum