

## **SPECIFICATION 150 – SURVEY AND STAKEOUT**

### **150-1 DESCRIPTION**

**150-1.01 Scope** - This work shall consist of the performance of all necessary survey work related to the construction of the roadway and structures, staking out, layouts, establishment of lines, elevations, grades and slopes as required, in accordance with the plans and specifications and as ordered by the Engineer. It shall include all the surveying necessary for utility relocations regardless of whether the utility work is performed by the owner or the Contractor.

### **150-2 MATERIALS**

**150-2.01** All instruments, equipment, stakes and any other material necessary to perform the work shall be provided by the Contractor. Stakes shall be of a type approved by the Engineer and shall be clearly and permanently marked so as to be legible at all times.

### **150-3 CONSTRUCTION REQUIREMENTS**

#### **150-3.01 General**

- a. The Engineer will furnish a base line and such reference bench marks as are considered sufficient for the Contractor to carry out his stakeout survey and layout of the project.
- b. The Contractor shall furnish for the survey work and stakeout competent and qualified personnel acceptable to the Engineer.
- c. The work shall proceed immediately upon issuance of the notice to proceed and shall be expeditiously progressed to completion in a manner and at a rate satisfactory to the Engineer. The Contractor shall keep the Engineer fully informed as to the progress of the survey.

## **SPECIFICATION 150 – SURVEY AND STAKEOUT**

- d. It shall be the Contractor's responsibility to maintain the survey and stakeout stakes in their proper position and location at all times.
- e. Any existing stakes or markers defining property lines and survey monuments which may be disturbed during construction shall be properly tied in to fixed reference points before being disturbed and accurately reset in their proper position upon completion of the work.

### **150-3.02 Survey and Stakeout**

- a. The Contractor shall remove or trim as required trees and brush and remove other interfering objects, not inconsistent with the plans, for survey lines in advance of all survey work to permit accurate and unimpeded work by his stakeout survey crews and the Engineer's cross section survey crews.
- b. The exact position of all work shall be established from control points, base line points or other points which are shown on the plans or as modified by the Engineer.
- c. Any error, apparent discrepancy or absence in or of data shown or required for accurately accomplishing the stakeout survey shall be referred to the Engineer for interpretation or for furnishing when such is observed or required.
- d. The Contractor shall be responsible for the accuracy of his work and shall maintain all reference point stakes, etc., throughout the life of the contract. Damaged or destroyed points, bench marks or stakes, or any reference points made inaccessible by the progress of the construction shall be replaced or transferred by the Contractor. Existing or new control points that will be destroyed during construction shall be transferred or reestablished before they are damaged or

## **SPECIFICATION 150 – SURVEY AND STAKEOUT**

destroyed and all reference ties recorded therefor shall be furnished to the Engineer.

e. All stakeout survey work shall be referenced to the centerlines shown on the plans.

f. All computations necessary to establish the exact position of the work from control points shall be made and preserved by the Contractor. All computations, survey notes and other records necessary to accomplish the work shall be neatly made, shall be made available to the Engineer upon request, and shall become the property of the Authority and delivered to the Engineer prior to final acceptance of the project.

g. The Engineer may check all or any portion of the stakeout survey work or notes made by the Contractor. Any necessary correction to the work shall be made immediately by the Contractor. Such checking by the Engineer shall not relieve the Contractor of any responsibilities for the accuracy or completeness of his work.

h. The Contractor will not be required or permitted to take the pre-construction or final cross sections that are used for payment purposes. These will be taken by the Engineer. However, the Contractor may have a representative as an observer when the cross sections are being taken. The pre-construction cross sections for excavation will be taken before the clearing and grubbing operations. Where borrow is to be placed on the existing ground, the cross sections will also be taken prior to clearing and grubbing.

i. All required right-of-way and easement limits shall be established, staked and referenced by the Contractor concurrent with the construction stakeout survey.

j. The Contractor shall place two offset stakes or references at each centerline station and at such intermediate

## **SPECIFICATION 150 – SURVEY AND STAKEOUT**

points as the Engineer may direct. From computations and measurements made by the Contractor, these stakes shall be clearly marked with the correct centerline station number, offset and cut or fill so as to permit the establishment of the exact centerline location and elevation during construction. If markings become faded or blurred for any reason they shall be restored by the Contractor at the request of the Engineer. The Contractor shall locate and place all cut, fill, slope, grade or other stakes and points as the Engineer may direct for the proper progress of the work. All control points shall be properly guarded and flagged for easy identification.

k. Structures shall be staked out by the Contractor at the locations and elevations shown on the plans or ordered by the Engineer. The Contractor shall also accurately establish the centerline of bearings on bridge abutments and piers by setting special hubs or reference points, so located and protected to insure their remaining undisturbed until such time as they are no longer needed. The Contractor shall accurately mark the location of anchor bolts to be installed and check the elevations of bearing surfaces and set bearing plates at their exact elevation.

l. Before the erection of the superstructure is started, the Contractor shall verify by accurate field measurements the location, both vertically and horizontally, of all bearings and shall assume full responsibility for the superstructure fitting the bearings and substructure as constructed.

m. Permanent survey marker locations shall be established and referenced by the Contractor, including markers required under Specification 621.

n. Prior to the final cross-section survey of the project by the Engineer, the Contractor shall reestablish the centerline or base line points and stationing, as well as any necessary bench marks and control points, as required by the Engineer.

## **SPECIFICATION 150 – SURVEY AND STAKEOUT**

o. During the progress of the construction work the Contractor will be required to furnish the entire surveying and stakeout incidental to the proper location by line and grade for each phase of the work. For paving and other operations requiring extreme accuracy, the Contractor shall re-stake the work with pins or other acceptable hubs located directly adjacent to the work and at the spacing directed by the Engineer.

### **150-4 METHOD OF MEASUREMENT**

**150-4.01** No measurement will be made of this item as it will not be paid for directly.

### **150-5 BASIS OF PAYMENT**

#### **150-5.01** Payment

a. All costs of Survey and Stakeout during construction and before the project is accepted shall be included in the unit prices of the various pay items as a subsidiary obligation and the Contractor will receive no direct compensation for such work.

b. When a new contract item is added or the original unit price for a contract item is subject to adjustment under the provisions of Articles 104.02, 104.03 or 104.04 of the General Provisions, the negotiated unit price applicable to such item may include the cost of any additional survey or stakeout work that is considered necessary.

c. No additional compensation will be paid for Survey and Stakeout costs, except as provided in paragraph b above, for any increase in contract time nor for any increases or decreases in contract quantities.

## **SPECIFICATION 151 – MOBILIZATION**

### **151-1 DESCRIPTION**

**151-1.01 Scope** - This item shall consist of all preparatory work and operations performed by the Contractor, including, but not limited to, those necessary for the movement of his personnel, equipment, supplies and incidentals to the project site; the establishment of all offices, shops, warehouses and any other buildings and areas required; and for other work and operations which must be performed or costs incurred prior to beginning work on the various items on the project site. Mobilization costs for subcontracted work shall be considered as included in this item.

### **151-2 MATERIALS**

**151-2.01** Such materials as are required for mobilization and that are not to be a part of the completed contract shall be as determined by the Contractor but they shall conform to all applicable Federal, Commonwealth and local laws, codes and regulations.

### **151-3 CONSTRUCTION REQUIREMENTS**

**151-3.01** The work and operations required to complete the mobilization shall be performed in a safe and workmanlike manner and shall comply with all applicable Federal, Commonwealth and local laws, codes and regulations.

### **151-4 METHOD OF MEASUREMENT**

**151-4.01** The method of measurement will be a lump sum.

### **151-5 BASIS OF PAYMENT**

**151-5.01** Partial payments will be made as the work progresses in accordance with the following schedule. Percentages shown are accumulated values.

- a. When 2 1/2 percent of the original contract is earned from other bid items, 25 percent of the amount bid for

## **SPECIFICATION 151 – MOBILIZATION**

mobilization or 2 1/2 percent of the original contract amount, whichever is lesser, will be paid.

b. When 5 percent of the original contract amount is earned from other bid items, 50 percent of the amount bid for mobilization or 5 percent of the original contract amount, whichever is lesser, will be paid.

c. When 10 percent of the original contract amount is earned from other bid items, 100 percent of the amount bid for mobilization or 10 percent of the original contract amount, whichever is lesser, will be paid.

d. Upon completion of all work on the project and final acceptance as per Section 109.08 of the General Provisions, payment of any pending amount bid for mobilization will be made.

**151-5.02** The total sum of all payments shall not exceed the original contract amount bid for the mobilization item regardless of the fact that the Contractor may have shut down his work in the Project or moved equipment away from the Project and then back again, except when a stop order is issued by the Authority for the convenience of the Authority and for reasons not attributable to negligence or fault on the part of the Contractor. In the case of such stop orders issued for the convenience of the Authority, a claim may be considered for expenses actually incurred by the Contractor for any required moving out and moving in of equipment if such moves are caused by the stop order.

**151-5.03** No deduction will be made and no increase will be made in the lump sum mobilization item regardless of any decreases or increases in quantities of other contract item and in the final contract amount nor for any extensions in contract time.

**151-5.04** When a new contract item is added or the unit price for a contract item is subject to adjustment under the provision of Sections 104.02, 104.03 or 104.04 of the General Provisions, the

**SPECIFICATION 151 – MOBILIZATION**

negotiated unit price applicable to such item may include any additional mobilization costs which are considered necessary.

**151-5.05** The contract lump sum price paid for mobilization shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in mobilization as specified herein.

**151-5.06** When the contract does not include a contract pay item for “Mobilization” as above specified, full compensation for any necessary mobilization required shall be included in the unit prices paid for the various contract items of work involved in the contract and no additional compensation will be allowed therefore.

**151-5.07** Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Mobilization.....	Lump Sum