

ITEM P-104 PROJECT SURVEY AND STAKEOUT

DESCRIPTION

104-1.1 Under this item, the Contractor shall do all necessary surveying required to construct all elements of the work as shown on the Contract Drawings and specified in the proposal and specifications. This shall include but not be limited to stakeout, layout and elevations for pavements, structures, forms and appurtenances as shown and required, consistent with the current practices and shall be performed by qualified personnel acceptable to the Engineer. The stakeout survey shall proceed immediately following the award of the Contract or as soon as authorized by the Owner 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 stakeout survey. All survey work shall be provided under the direction of a licensed land surveyor.

MATERIALS

104-2.1 All instruments, equipment, stakes and any other material necessary to perform the work satisfactorily shall be provided by the Contractor.

All stakes used shall be of a type approved by the Engineer. It shall be the Contractor's responsibility to maintain these stakes in their proper position and location at all times.

The Contractor shall supply to the Engineer a rod, level and tripod for his exclusive use during the entire project. The rod shall be 15 feet in length with hundredth-of-a-foot graduation. The level shall be self-leveling and have documentation demonstrating it has been calibrated within one month of the work commencement. All provided equipment shall be in good working order and maintained by the Contractor throughout the course of the project.

CONSTRUCTION METHODS

104-3.1 The Contractor shall trim trees, brush and other interfering objects, not inconsistent with the Contract Drawings, from survey lines in advance of all survey work to permit accurate and unimpeded work by his stakeout survey crews.

The exact position of all work shall be established from control points, baseline transit points or other points of similar nature that are shown on the Contract Drawings and/or modified by the Engineer. 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 furnishing when such is observed or required.

The Contractor shall place two offset stakes or references at each centerline station and at such intermediate locations as the Engineer may direct. From computations and measurements made by the Contractor, these stakes shall be clearly and legibly 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, the markings shall be restored by the Contractor at the request of the Engineer. He shall locate and place all cut, fill, slope, fine 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.

Drainage structures shall be staked out by the Contractor at the locations and elevations shown on the Contract Drawings or specified by the Engineer.

Reference points, baselines, stakes and benchmarks for borrow pits shall be established by the Contractor.

Permanent survey marker locations shall be established and referenced by the Contractor.

The Contractor shall be responsible for the accuracy of his work and shall maintain all reference points, stakes, etc., throughout the life of the work. Damaged or destroyed points, benchmarks or stakes, or any reference points made inaccessible by the progress of the construction, shall be replaced or transferred by the Contractor. Any of the above points which may be destroyed or damaged shall be transferred by the Contractor before they are damaged or destroyed. All control points shall be referenced by ties to acceptable objects and recorded. Any alterations or revisions in the ties shall be so noted and the information furnished to the Engineer immediately. All stakeout survey work shall be referenced to the centerlines shown on the Contract Drawings. 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. Such computations, survey notes and other records shall be made available to the Engineer upon request and shall become the property of the Owner and delivered to the Engineer not later than the date of acceptance of the Contract.

The Contractor shall furnish, at his expense, all horizontal and vertical control, all staking and layout of construction work called for on the plans and the Engineer and Owner shall not be responsible for such work. However, the Owner and Engineer reserve the right to check all said lines, grades, and measurements with their appointed surveyor. Should the Owner's surveyor detect errors in said lines, grades, and measurements, the Contractor shall pay for all said surveying costs and subsequent surveying costs performed to verify correction of errors found in said lines, grades and measurements. Included in this are all blue top staking for subgrade and base course installation. Definition of an error shall be a discrepancy of 1/4" or more. In the case of a discrepancy between the technical specifications and this defined tolerance, this tolerance shall govern.

Prior to the final cross-section survey of the work by the Contractor, the Contractor shall reestablish centerline or baseline points and stationing as required by the Engineer.

Prior to the final cross-section survey of any borrow pits, the Contractor shall reestablish the baseline points and stationing, as well as any necessary benchmarks as required by the Engineer.

During the progress of the construction work, the Contractor will be required to furnish all of the surveying and stakeout incidental to the proper location by line and grade for each phase of the work. For paving and any other operation requiring extreme accuracy, the Contractor will restake with pins or other acceptable hubs located directly adjacent to the work at a spacing directed by the Engineer.

Any existing stakes, iron pins, survey monuments or other markers defining property lines which may be disturbed during construction shall be properly tied into fixed reference points before being disturbed and accurately reset in their proper position upon completion of the work.

Just prior to completion of the work, the Contractor shall reestablish, if necessary, and retie all control points as permanently as possible and to the satisfaction of the Engineer.

104-3.2 The Contractor shall be required to submit cross sectional data to the Engineer at monthly intervals prior to the Contractor submittal of the monthly application for payment so that the Engineer can verify the quantities of various earthwork and materials volumes for payment. All cross sectional data provided at any time will be in AutoCad 2007 or higher format only. No other formats will be accepted. If the data is submitted in another format other than AutoCad, no earthwork or other materials volumes will be calculated and approved for payment. The earthwork shall include, but not be limited to, unclassified excavation, embankment, new or existing subbase courses, new or existing base courses, sand/asphalt subgrade, topsoil, etc.

METHOD OF MEASUREMENT

104-4.1 Payment will be made at the lump sum price bid for this item.

BASIS OF PAYMENT

104-5.1 The lump sum price bid shall include the cost of furnishing all labor, equipment, instruments and all other material necessary to satisfactorily complete the work's surveying and stakeout. Partial payments will be made at the discretion of the Engineer as the work progresses based generally on the percentage of actual work completed compared to the total construction cost.

Payment will be made under:

Item P-104-5.1	Project Survey and Stakeout - Per Lump Sum.
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TESTING REQUIREMENTS

104-6.1 None.

END OF ITEM P-104