

SECTION 114 -- CONSTRUCTION SURVEYING

114.01 -- Description

1. Department and Contractor Responsibilities:

Each project will have the construction staking and surveying done by either the Contractor or the Department. When the pay item "Construction Staking and Surveying" is shown in the bid proposal Schedule of Items and in the plans, then the Contractor shall accomplish the requirements in Paragraph 3. of this Subsection. When the Department has the responsibility to accomplish the construction staking and surveying shown in Paragraph 2. of this Subsection, then the pay item "Construction Staking and Surveying" will **not** be shown in the plans or the Schedule of Items.

2. Department provided construction stakes, lines, and grades shall include:

a. The Engineer will furnish and set construction stakes or benchmarks establishing lines and grades and will furnish the Contractor with all necessary information relating to them. For bridges, the Contractor may require the Engineer to furnish stakes determining the centerlines of all substructure units, together with stakes determining the angles of the wings or retaining walls.

b. The Contractor shall furnish, free of charge, all additional stakes, templates, and other materials necessary for marking and maintaining all reference points and lines. The Contractor shall construct the work in accordance with the Engineer's stakes and marks, making use of them before they are disturbed.

c. The Contractor shall be responsible for the preservation of all stakes and marks. The cost of replacing any stakes or marks destroyed or disturbed by the Contractor shall be charged against, and deducted from, the payment for the work at the rate of \$125 per hour for each hour of NDR survey time spent replacing the Contractor disturbed reference points.

d. The Department will not be responsible for delays due to lack of stakes unless the Contractor, when moving onto the work, has given one week's notice that such stakes are needed. Thereafter, 48 hours notice is required.

3. Contractor provided construction stakes, lines, and grades:

a. The plans and the bid proposal Schedule of Items will show the pay item "Construction Staking and Surveying" when the Contractor is responsible for survey staking requirements.

b. Contractor Construction Staking shall consist of:

- (1) Establishing or reestablishing the project centerline.
- (2) Referencing or rereferencing all necessary control points.

benchmarks. (3) Running a circuit of bench levels to check or reestablish plan

(4) Setting other benchmarks as needed.

(5) Staking right-of-way or restaking right-of-way where needed if it has been previously staked and performing all construction layout and reference staking necessary for the proper control and satisfactory completion of all structures, grading, paving, drainage, and all other appurtenances required for the completion of the construction work and acceptance of the project.

(6) Providing flagging and signage for traffic control.

c. Construction Requirements:

(1) (i) The construction staking shall be done by personnel who are trained and experienced in construction layout and staking of the type and kind required in the contract.

(ii) If the Contractor subcontracts the "Construction Staking and Surveying," the work shall be done under the direction of a registered Professional Engineer or registered Land Surveyor.

(iii) All right-of-way monuments and lines shall be established by a registered Land Surveyor employed by the Contractor.

(iv) It is recommended that the crew chief be NICET Certified Level III or a registered Land Surveyor.

(v) It is recommended that 50 percent of the survey crew be NICET Certified Level II.

(2) All stakes, references, lines, grades, and batter boards which may be required for the construction operations shall be furnished, set, and properly referenced by the Contractor in a manner consistent with standard engineering practices and in accordance with the Department's *Construction Manual* or alternate procedures approved by the Engineer. The Contractor shall be solely and completely responsible for the accuracy of the line and grade of all features of the work. Any errors or apparent discrepancies found in previous surveys, plans, specifications, or special provisions shall be immediately called to the attention of the Engineer by the Contractor for correction or interpretation before proceeding with the work.

(3) Field notes shall be kept in standard, bound field notebooks or in a Department approved computer file. The data shall be clear, orderly, and neat; consistent with standard engineering practices; and in accordance with the Department's notebook procedures. The Contractor shall provide the notebooks, which become the property of the Department upon completion of the project. The field notebooks shall be subject to inspection by NDR project personnel at any time.

(4) The Contractor shall be responsible for the placement and preservation of adequate ties and references to all control points, whether established by him/her or found on the project, necessary for the accurate reestablishment of all base lines or centerlines shown in the plans. All land ties (i.e., section corners, fractional section corners, etc.) that may be lost or destroyed during construction shall be carefully referenced and replaced by a licensed Nebraska Land Surveyor in accordance with the NDR *Construction Manual*. A copy of the completed survey and references to the corner or accessory shall be filed with the State Surveyor and with the County Surveyor for the county or counties in which the survey corner exists within 30 days of the date the activity is completed.

(5) On road projects, the circuit of bench levels to check the plan benchmarks shall be run the full length of the project. At bridge sites, the circuit shall include four benchmarks; if possible, two on each end of the structure.

(6) The Engineer will make all necessary final checks, measurements, and surveys that involve the determination of final pay quantities. He/she may check the accuracy and control of the work, as established by the Contractor's construction staking, at any time as the work progresses. These checks made by the Engineer in no way relieve the Contractor of his/her responsibility for the accuracy of the engineering layout.

(7) The Contractor shall correct any deficient staking or construction work which resulted from inaccuracies in the staking operations or from the Contractor's failure to report inaccuracies in the plans or survey data furnished by the Department.

(8) Following a written request by the Contractor, the Engineer may approve the start of construction staking operations before the Notice to Proceed date.

114.02 -- Method of Measurement

Construction staking and surveying will be measured as a lump sum for all surveying and staking requirements.

114.03 -- Basis of Payment

- | 1. | <u>Pay Item</u> | <u>Pay Unit</u> |
|----|---|-----------------|
| | Construction Staking and Surveying | Lump Sum (LS) |
| 2. | Payment is full compensation for all work prescribed in Subsection 114.01, Paragraph 3. | |