



SP GP 2 2.9-001 (2013)

Standard Specifications for Construction City of Waco 2013 Special Provision to General Provision Section 2 Scope and Control of the Work 2.9 Surveying

November 2, 2018

The Standard Specifications for Construction City of Waco 2013
General Provision Section 2 Scope and Control of the Work
2.9 Surveying

is hereby deleted in its entirety and replaced as follows:

2.9 SURVEYING

PART 1: GENERAL

A. DESCRIPTION

This specification describes Construction Survey Staking, also commonly known as Site Layout Staking. This survey staking is performed before construction to set all lines, grades and elevations according to the design plans.

This specification establishes a minimum standard of field survey specifications and procedures to properly control Municipal construction projects. The Contractor shall ensure that commonly accepted survey methods and procedures are followed. See the Texas Society of Professional Surveyors (TSPS) Manual of Practice for Land Surveying in the State of Texas for acceptable methods. Errors or damages resulting from the Contractor's survey shall be corrected or made whole at the expense of the Contractor. The Owner shall not be held liable for any additional expense. Any method conflicting with these survey specifications must be approved by the Engineer prior to its use.

B. SUBMITTALS

(1) Deliverables - Upon completion of the project, the contractor will provide the City Engineer or its representative all original surveying field notes, layouts and computations in standard bound survey notebooks or in an acceptable form. It is also imperative that the Contractor and Project Representative for the City have cut sheets in hand prior to construction. The City will order Contractor to cease working if this requirement is not met.

(2) Required Information – All cut sheets must identify benchmarks used, benchmark elevations, actual hub elevations, proposed elevations and cuts or fills for all entries.

PART 2: PRODUCT

A. MATERIALS

The Contractor shall furnish all labor and materials necessary to perform all surveying and staking essential for the completion of construction in conformance with the Drawings, Specifications, and Contract Documents. The Contractor shall perform all the necessary Work and calculations required to accomplish the Work in accordance with this specification.

B. EQUIPMENT

Not applicable.

PART 3: EXECUTION

A. MONUMENT DISCOVERY

(3) Monument Provisions - The Owner may or may not provide project horizontal and vertical control monuments to facilitate construction staking. Regardless, the Contractor shall recover project survey control monuments which may be shown on the Drawings or establish project survey control monuments to ensure the project is properly located and constructed according to the Contract Documents.

(4) Monument Location - Prior to construction, the Contractor shall locate these monuments to ensure they have not been destroyed.

(5) Missing Monuments - In the event the Contractor is unable to locate certain monuments, the Contractor shall notify the Engineer immediately and provide five (5) working days for the Engineer to reestablish the missing monumentation. The Contractor shall have no basis for a claim requesting additional compensation for costs incurred due to missing survey control which is shown on the Drawings, unless the Engineer fails to reestablish said control within five (5) working days after written notification from Contractor. The Engineer may or may not determine that the Contractor may be entitled an extension of time.

B. DISCREPANCIES

The Contractor shall notify the Engineer immediately if a discrepancy exists between the field conditions and the Contract Documents. Project staking, which would be directly affected by the discrepancy, shall cease until further notice by the Engineer. Work unaffected by the discrepancy shall continue uninterrupted.

C. RE-ESTABLISHING MONUMENTS

The Contractor is responsible for preserving and protecting all monuments and lot corners, line stakes, grade stakes, reference points, and hubs. If a monument or boundary pin needs to be moved, the Contractor shall work with a Registered Professional Land Surveyor (R.P.L.S.) to have this done. In the event of their loss or destruction, the Contractor shall pay all costs for their replacement by an R.P.L.S.

D. ACCEPTABLE FORMS OF GROUND STAKES:

(1) Acceptable ground stakes –

- (a) small wooden hub (ginnie) in front of the marker/reference stake,
- (b) a wooden hub and tack in front of the marker/reference stake,
- (c) a spike driven in front of the marker stake,
- (d) a concrete nail in asphalt concrete pavement
- (e) a scribed "X" on Portland cement concrete pavement, or
- (f) the marker stake itself, depending on the precision required and field conditions (typically for fencing and clearing limits).

(2) Laths - 48" laths with flagging are used only when extra visibility is needed, typically when stakes are in tall vegetation, or as guard stakes to protect survey control monuments and marker stakes.

E. PROJECT TYPES:

(1) Sanitary Sewer:

- (a) Sewer Main: Line and grade stakes (Center Line [CL] and Offsets) with cut to invert shall be set every 25' for the first 100' out of the downstream manhole, and every 50' thereafter to the next manhole. A hub shall be set at each stake.
- (b) Sanitary Sewer Manholes: Two survey stakes at each manhole showing cut to the invert in, invert out and a cut or fill to the rim elevation.
- (c) Proposed elevations of service inverts at the right-of-way line shall be staked and shown on the cut sheets.

(2) Water Main:

- (a) Line and grade stakes shall be set every 50' (CL and Offsets)
- (b) Fitting locations shall be staked and the stationing shown on the cut sheets (CL and Offsets).
- (c) Line and grade stakes (CL and Offsets) shall be set for all hydrants.
- (d) Proposed elevations of the tops of meter boxes (when given on design plans) shall be staked and shown on the cut sheets. Line reference stakes shall be set for curb box locations.

(3) Storm Sewer:

- (a) Line and grade stakes shall be set every 25' for the first 100' out of the downstream manhole, and every 50' thereafter to the next manhole or inlet box.

- (b) Inlet boxes: Line and grade stakes (with Offsets) shall be set for at least two inlet corners. This also applies to other types of inlets, such as grate inlets.

(4) Streets:

- (a) When CL stakes are set for grading subgrade, cut sheets shall be provided (unless blue tops are set).
- (b) Line and grade stakes (CL and Offsets) shall be set every 25 feet and for all begin, mid and end rad points at all street intersections.
- (c) Curb and Gutter: Reference stakes shall be set at even fifty foot (50') stations on tangents as shown on the Drawings. Horizontal curves shall be staked on even twenty-five foot (25') stations. All grade breaks, Point of Vertical Curves, Point of Vertical Tangents, low points and high points on vertical curves shall also be staked. A hub and tack shall be set at an offset distance of three feet (3') to the top back of curb. A stake will be set behind the hub and tack with the offset distance marked below the offset and the station marked on the back of the stake. The cut and fill will be to the top back-of-curb within three hundredths of a foot (0.03'). All radius points at curb returns will be staked and additional stakes set breaking up the arc of the curve between curb returns. If valley gutters are to be built, they shall be staked and referenced.

(5) Sidewalks:

- (a) Line and grade stakes (CL and Offsets) shall be set every 25 feet and for all begin, mid and end rad points.
- (b) Ramps and landings shall be staked at all points of intersection, and the gutter at bottom landings shall be staked at all begin, mid and end rad points.

(6) Limits of Construction:

- (a) All permanent and temporary construction easements shall be staked prior to starting construction. Stakes shall be placed every 50' along the easement line and every point of intersection. Horizontal curves shall be staked at the beginning, middle and end points.

PART 4: MEASUREMENT AND PAYMENT

- A. MEASUREMENT AND PAYMENT**
Not applicable.

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