

**DESCRIPTION**

All work performed shall be in accordance with the NYSDOT Standard Specifications, and Applicable Addendums., miscellaneous, and specifically, all subsections referring to Project Survey and Stakeout shall apply, except as modified below:

All work under this item shall be done under the supervision of a Land Surveyor licensed to practice in the State of New York.

**CONSTRUCTION DETAILS**

All provisions of NYSDOT Standard Specifications, Section 625-3.01, latest revision, shall apply with the following additions.

**CONTROL MONUMENTATION FOR THE CONSTRUCTION PROJECT**

The GENERAL CONTRACTOR shall check and verify the control information as shown on the project plans. The GENERAL CONTRACTOR shall submit a letter with a survey report and field notes acknowledging their acceptance of the correctness of the control information as shown on the project plans, to the Resident Engineer and Monroe County Surveyors Office prior to the start of construction.

The GENERAL CONTRACTOR shall secure survey tie information to all of the monuments shown on the project plans of the job site to be protected. The tie information shall be by angle and distance to points that are identifiable, permanent, substantial, not subject to being disturbed during the construction period, and no more than 40 m from the point being tied down. Distance ties may be made with either an electronic Distance Measuring Instrument (rated with an internal uncertainty of no more than 0.003 m and scale of no more than 3 parts-per-million (ppm)) or a surveyor's tape that has been checked against a standard tape traceable to the national standard of reference. The distance measurements shall be corrected for both temperature and pressure as necessary. The angulation shall be performed with a directional theodolite or total station that has an internal least count of no more than 2 seconds. A minimum of two positions on the circle (both direct and reverse) shall be taken and any of the individual positions shall differ from the mean of all positions by no more than 5 seconds. The sum of all of the individual measurements shall produce a circle of confidence (at the 95% confidence level) that does not exceed 0.007 m (0.02 ft) in regard to the true position of monument relative to the monument ties. The GENERAL CONTRACTOR shall submit copies of the field notes of the ties to the Resident Engineer and Monroe County Surveyors Office prior to the start of construction. If the monument also has a published elevation on the monument, the contractor's surveyor shall also reference the monument to a minimum of three vertical tie points that are identifiable, permanent, substantial, not subject to being disturbed during the construction period, and no more than 75 m from the point being tied down. The reference elevations on the vertical tie points shall have an uncertainty relative to the reference monument of no more than 0.002 m (0.006 ft) relative to the monument being referenced.

As of the date of the start work order, all monuments as shown on the project plans of the job site to be protected shall be the responsibility of the GENERAL CONTRACTOR.

If a protected monument is destroyed after the date of the start work order, the GENERAL CONTRACTOR shall be ultimately responsible for the expense of the replacement of the monument.

In the event that a protected monument is destroyed during construction, the survey monument shall be replaced by the Monroe County Surveyor, and there shall be a \$2,000 deduction from the cost of the contract in favor of the County.

A survey monument will be considered destroyed that has been:

- Moved more than 0.007 m (0.02 ft) in any direction from the ties provided by and certified to by the Contractor's Licensed Land Surveyor
- Broken.
- Disturbed to a point that the survey monument's position is no longer fixed or stable.
- Removed from the ground for any reason.
- Vertically adjusted without the written authorization of the Monroe County Surveyors Office.

#### **PROPERTY CORNER POINTS WITHIN OR ADJOINING THE CONSTRUCTION SITE**

The GENERAL CONTRACTOR shall check and verify the existence of all property corner points as shown on the project plans. The GENERAL CONTRACTOR shall submit a letter acknowledging acceptance of the correctness of the property corner points as shown on the project plans to the Resident Engineer and Monroe County Surveyors Office prior to the start of construction.

As of the date of the start work order, all property corner points as shown on the project plans of the job site to be protected shall be the responsibility of the GENERAL CONTRACTOR.

If a protected property corner point is disturbed or destroyed after the date of the start work order, the GENERAL CONTRACTOR shall be ultimately responsible for the expense of the replacement of any property corner point that has been disturbed or destroyed.

#### **PRESERVATION OF THE PROJECT SURVEY BASELINE AND/OR PROJECT CENTERLINE**

Prior to the completion of the Project, the GENERAL CONTRACTOR shall notify the Resident Engineer and Monroe County Surveyor's Office of the Contractor's intent to make ties of the Contractor's secondary control to the existing Project Control

Monumentation and any proposed control monumentation to be set on the project.

Either the County Surveyors Office or the Project Surveyor assigned by the Project Engineer shall set or have set any additional monumentation necessary for the completion of the Project. Once the additional control has been set, the County Surveyors Office, or the Project Surveyor assigned by the Project Engineer, shall notify the Resident Engineer and the GENERAL CONTRACTOR of the location of said additional control monumentation. A notice to proceed with Contractor’s survey shall be issued to tie the Contractors secondary control into all of the control monumentation. The survey shall be completed so that the contractor’s control is tied to all of the project monumentation

Once the survey is complete, the GENERAL CONTRACTOR shall submit field notes of the survey and a survey report along with a certification by the licensed surveyor supervising the work that the secondary points, the project baseline and/or centerline are positioned relative to the project control by the following formula:

- s = Square Root of( $e^2 + (0.1pd)^2$ ) where:
- s = maximum allowable error in centimeters at the 95% confidence level
- d = distance in kilometers between any two stations
- p = the minimum geometric relative positional accuracy in part-per-million (ppm) at the 95% confidence level.
- e = base error in centimeters (this includes station-dependent setup error) where:
- p = 75 ppm
- e = 1 cm

or as required by the Resident Engineer and/or the Monroe County Surveyors Office.

The survey report shall include direct mathematical relationships between the control monumentation, the GENERAL CONTRACTOR’s secondary control, and the project baseline and or centerline.

**BASIS OF PAYMENT**

Payment will be made under:

<b><u>Item No.</u></b>	<b><u>Item</u></b>	<b><u>Pay Unit</u></b>
C639.01	Survey and Stakeout	Lump Sum