DESCRIPTION

All provisions of NYSDOT Standard Specifications, Section 625, latest revision, shall apply for Survey Operations with the following additions.
This work shall be performed by, or under the direction of, a Professional Land Surveyor who is licensed and registered to practice in New York State.

CONSTRUCTION DETAILS

CONTROL MONUMENTATION FOR THE CONSTRUCTION PROJECT

As of the date of the Notice to Proceed, all survey control monuments as shown on the project plans of the job site are to be protected and shall be the responsibility of the GENERAL CONTRACTOR.

The GENERAL CONTRACTOR shall check and verify the survey 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.

PRESERVATION OF GEODETIC MONUMENTS

As of the date of the Notice to Proceed, all geodetic monuments as shown on the project plans of the job site are to be protected and shall be the responsibility of the GENERAL CONTRACTOR.

"The contractor's attention is directed to Monroe County Local Law No. 6 of 1971 regarding liability incurred through disturbance or destruction of Geodetic Survey Monuments. The Contractor shall locate, mark, barricade, safeguard and preserve all survey control monuments and right of way monuments in the areas of construction. For descriptive and survey data for geodetic control monuments, go to the County of Monroe Surveyors Office Webpage at: http://www2.monroecounty.gov/property-survey.php and use the link to the Geodetic Monument Web Viewer or contact Gregory Bly, P.L.S., County Surveyor, Monroe County Surveyor's Office at 585-753-1156 or GregoryBly@monroecounty.gov."

The GENERAL CONTRACTOR shall secure survey monument tie information to all Geodetic monuments shown on the Project Plans that are required to be monitored due to close proximity of proposed construction. Geodetic monument monitoring shall be performed under the direction of a licensed land surveyor, and paid under and performed in accordance with the requirements of Monroe County Standard Construction Specifications Item C625.0206, Geodetic Monument Monitoring.

A survey monument will be considered disturbed and destroyed that has been:

- Moved equal to or in excess of 0.02', in either the horizontal or vertical direction.
- 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.

If a geodetic monument is destroyed after the date of the Notice to Proceed, the GENERAL CONTRACTOR shall be ultimately responsible for the expense of the replacement of the monument. The geodetic monument shall be replaced under the direction of a licensed land surveyor in accordance with the requirements of Monroe County Standard Construction Specifications Item C625.0203, Install New Geodetic Survey Monument.

In the event that a geodetic monument is destroyed during construction and the GENERAL CONTRACTOR fails to replace the monument, the survey monument shall be replaced by the Monroe County Surveyor, and there shall be a $2,500 deduction from the cost of the contract in favor of the County.

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 Notice to Proceed, all property corner points as shown on the project plans of the job site are to be protected and shall be the responsibility of the GENERAL CONTRACTOR.

If a property corner point is disturbed or destroyed after the date of the Notice to Proceed, the GENERAL CONTRACTOR shall be ultimately responsible for the expense of the replacement of any property corner point that has been disturbed or destroyed. The property corner shall be replaced under the direction of a licensed land surveyor in accordance with the requirements of Monroe County Standard Construction Specifications Item C625.05, Steel Pin and Cap Right of Way Markers.

In the event that a property corner is destroyed during construction and the GENERAL CONTRACTOR fails to replace the property corner, the property corner shall be replaced by the Monroe County Surveyor, and for each property corner there shall be a $500 deduction from the cost of the contract in favor of the County.

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 Contractors intent to make survey ties of the Contractor's secondary control to the existing Project Control Monumentation and any proposed control monumentation to be set on the project.

The Project Surveyor assigned by the Project Engineer shall set any additional control monumentation necessary for the completion of the Project. Once the additional control monumentation has been set, 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 for secondary control 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 in accordance with the following requirements.

The Project Surveyor shall establish survey control by providing any necessary permanent horizontal and vertical survey control baseline monuments that will have a high probability of surviving without being disturbed throughout the duration of the proposed construction project. Survey control monuments shall consist of a pin and cap with drill hole and identifying markings, railroad spike with drill hole, PK or Mag nail. The Project Surveyor shall provide a written description of each survey control monument and a tabulated reference to the survey control baseline. Each survey control monument shall be measured with ties to 3 or 4 specific features that will provide for recovery of the survey control monument in the future. These ties shall meet the following criteria:

- Attempt to spread ties through 360º, for strength of resection.
- Diversify tie types with no more than two ties to a single type of reference.
- Avoid ties to manhole rims, curbing, et cetera, that will be destroyed during the process of construction.

- Ties are to be taken to substantial, well defined and described, permanent points.

The survey control baseline position shall be established and localized to the original project survey control baseline utilizing conventional Theodolite or Total Station terrestrial survey techniques only, without employing GPS survey techniques.

While employing conventional Theodolite or Total Station terrestrial survey techniques, surveys shall be performed with either an Electronic Distance Measuring Instrument (EDM) (rated with an internal uncertainty of no more than 0.003 m and scale of no more than 2 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 EDM distance measurements shall be corrected for both temperature and pressure as necessary and the taped measurements shall be corrected for temperature, sag, tension and slope. 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) and an EDM distance shall be taken along with each angle measurement. Any of the individual angles shall differ from the mean of all angles by no more than 5 seconds and individual distances shall differ from the mean of all distances by no more than 0.01 feet and 2 parts per million (ppm). Adjustments shall be completed by a minimally constrained least squares adjustment. From the least squares adjustment the maximum allowable Local Positional Accuracy (at the two sigma, 95% confidence level) shall not exceed 0.025 feet or a precision of 1 part in 20,000 parts (1:20,000). The raw data and least squares report shall be provided to the County Surveyor for review and acceptance.

Primary Vertical Control for the survey control baseline, shall be established by either conventional leveling or by trigonometric leveling techniques and shall close within 0.033ft*SQRT(*D*) where *D* is equal to the length of the level run in miles.

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:

Item No.	**Item**	**Pay Unit**
C625.01	Survey Operations	Lump Sum