To: SUPERSEDED BY EI 12-020 EFFECTIVE 1/10/13		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 00-012

Title: **SECTION 625 - RIGHT-OF-WAY MARKERS, SECTION 626 - SURVEY MARKERS, SECTION 634 - MISCELLANEOUS**

Distribution:
- ☒ Manufacturers (18)
- ☒ Main Office (30)
- ☒ Local Govt. (31)
- ☒ Regions/Agencies (32)
- ☒ Surveyors (33)
- ☒ Consultants (34)
- ☒ Contractors (39)
- ☐ _____( )

Approved:

P. J. Clark, Deputy Chief Engineer (Facilities Design) — Date: 05/25/00

Effective Date. This Engineering Instruction (EI) is effective with projects submitted for the letting of November 2, 2000.

Administrative Information. The purpose of this EI is to issue revised Section 625 specifications, which include all Survey Operations, Right of Way Marker and Permanent Survey Marker Specifications and to issue guidance on their use. This EI does not supersede any previous issuances.

The attached specifications will be incorporated into future versions of the NYS DOT Standard Specifications.

The attached guidance is supplemental information for Designers or Engineers-in-Charge and will be incorporated into Chapter 5 of the Highway Design Manual.

The Standard Sheet M625-1R1 and surveyor certification forms are transmitted by EB00-036 and will be incorporated into future versions of New York State Standard Sheets and of the Construction Inspection Manual (CIM), respectively.

Main Office Construction Division will issue CIM Section 625 "Surveyor's Certifications" separately. The surveyor certification forms will be issued, in the near future, as Exhibits to new Section 625.00 of the CIM.

The attached specifications are a Shelf Note and a Main Office insert.

Background. Several Regional Land Surveyors requested wording changes to the attached Spec Book Sections. This EI and attached Specifications incorporate the requested wording changes clarify the intent of the work to be done and identify the responsibilities associated with the work. The revised specifications are unified under Section 625 of the Standard Specification of January 2, 1995 and Sections 626 and 634 are eliminated.

This instruction issues modifications to the Construction Inspection Manual (Surveyor's Certifications for Permanent Survey Markers and Right-of-Way Markers) and consolidates the survey specifications contained in Section 625, 626 and 634 into new Section 625. The changes are as described below and the existing Sections 626 and 634 are eliminated.

Existing Items 625.03 M and 625.05 M remain unchanged. New Item 625.04 M "Concrete Right-of-Way Markers Type L (Low)" is added. The previously numbered Items 634.01 M and 626.01 M are now Items 625.01 M and 625.06 M, respectively. Item 634.03 M is moved, without change, to Section 637 and is now numbered 637.03 M. Item 634.02 M is eliminated because it is already part of existing item 308.01 M.

Attachments. Attached are a two-page document titled "Guidance on the Use of Steel Pin, Low or High Concrete Right of Way Markers" and a shelf note on "Survey Operations" which includes revised Section 625 and changes to Sections 626, 634, and 637 of the Standard Specifications of January 2, 1995.

Contact. Chuck Torre, Design Quality Assurance Bureau at (518) 485-5632 and Dan Streett, Design Services Bureau at (518) 485-8227.

Guidance on The Use of Steel Pin, Low or High Concrete Right of Way Markers

Purpose of ROW Markers:

There are three purposes for setting Right of Way (ROW) Markers along a highway to delineate the right of way. Two purposes are to assist adjacent land owners in the identification of the limits of the highway boundary adjacent to their property, and to assist maintenance crews in determining the limits of the highway which they are maintaining. The third purpose is to monument the limits of the right of way which provides secondary control for future reestablishment of the highway boundary.

Where and When to use ROW Markers:

All new right of way limits should be monumented as part of their associated construction projects. ROW Markers should be installed at all bend points along the proposed or new right of way boundary. ROW Markers are intended to delineate the boundary between the highway and private property, and mark any changes in the direction of that boundary line. No markers should be placed at property lines, except in unavoidable situations where an acquisition has to end at a property line. ROW Markers are not intended to monument the property lines between private properties. Recommendations on where and when to place ROW Markers should be reviewed by the Regional Land Surveyor.

Which ROW Markers to Use:

There are many factors which need to be considered when choosing between the three types of ROW markers. Consideration should be given to the safety of adjacent land owners and the general public, the aesthetics of the project area, the existing or anticipated land use of an area, and the ground conditions. It is recommended that proposed ROW Marker locations and types be reviewed by the Regional Land Surveyor.

1. Safety - Consideration should be given to whether pedestrians, bicyclists, land owners, or vehicular traffic could be exposed to a hazard by placing a high or low concrete marker adjacent to or within a sidewalk, public path, lawn area, or driveway. The concrete marker represents a fixed object, and therefore, should not intrude into a highway's clear zone or be in close proximity to the highway's shoulder. In these cases, a steel pin ROW marker should be used.

2. Aesthetics - Consideration should be given to what the visual impact on a project area might be by installing high concrete markers along a highway. Creating a line of high markers (fence post look) may have a negative effect on the aesthetics of the completed project. In situations where markers will be visually evident and could potentially create a less than desirable effect on the area's aesthetics, use of low or steel pin markers should be considered. Any use of concrete markers on or adjacent to historically significant or contributing properties, should be

coordinated with the regional contact for historic and cultural resources.

3. Land Use - Consideration should be given to what the present or anticipated land use is for the adjacent properties. It would not be desirable to install concrete markers in existing or proposed parking lots, driveways or sidewalks, maintained lawn areas, or on parklands. In contrast, it would be advisable to consider the use of either high or low concrete markers near cultivated fields (since they need to be seen to be avoided), and use high concrete markers in unimproved areas which are heavily underbrushed, swampy, or include standing water, to simplify their rediscovery in the future. Low concrete or steel pin markers are appropriate along interstates which also have fencing to delineate the right of way limits. Low concrete or steel pin markers should be used on or near commercial properties, depending on proximity to walks or driveways, and the resulting landscaped appearance after installation.

4. Ground Conditions - Consideration should be given to the types of ground materials or the underground utilities where markers are to be set. Rock outcroppings may necessitate the use of steel pin markers (by drilling and grouting), and high water table or unstable soils may warrant concrete markers to ensure their stability. Underground utilities should certainly warrant care on the contractor's part during installation, but assessing the depth that a marker is to be set over utilities or pipes during design may suggest the need for special notes or adjustments to the recommended marker locations.

SURVEY OPERATIONS

Make the following ***changes*** to the Standard Specifications of January 2, 1995:

Page 6-112, line 17, ***replace*** **SECTION 625 - RIGHT OF WAY MARKERS** with the following:

"SECTION 625 - SURVEY OPERATIONS, ROW MARKERS, & PERMANENT SURVEY MARKERS

625-1 DESCRIPTION

625-1.01 PROJECT SURVEY AND STAKEOUT. Under this work the Contractor shall do all necessary surveying required to construct all elements of the project as shown on the plans and specified in the proposal and specifications, and to protect all boundary and survey markers which are either shown on the plans or discovered on the project site. This work shall include but not be limited to stakeout, layout, and elevations for the highway, structures, forms, pile layouts and appurtenances as shown and required, consistent with the current practices of the Department, and shall be performed by competently qualified personnel acceptable to the Engineer. This shall also include all work necessary to preserve the location of all existing boundary or right of way and survey markers which should not be in direct conflict with the work to be performed under the contract, as well as all private property monumentation which is in direct conflict with the work to be performed under the contract. Where railroad relocation or alteration is done by force account by the railroad or by the Contractor, all necessary surveying is to be done as part of this work as directed by the Engineer. All survey stake-out shall proceed immediately following the award of the contract 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 control work shall be done in accordance with the Department's "Surveying Standards & Procedures Manual".

625-1.02 RIGHT OF WAY MARKERS. Under this work, the Contractor shall locate, furnish, place and certify right-of-way markers at the locations indicated on the plans or where shown on right-of-way maps or where directed by the Engineer, in accordance with the details shown on the appropriate Standard Sheet, these specifications, and the directions of the Engineer. The Contractor shall verify with the Engineer, their use of the most current Right of Way Acquisition Maps to determine the appropriate locations of the proposed markers.

625-1.03 PERMANENT SURVEY MARKERS. Under this work the Contractor shall furnish and place permanent survey markers at locations indicated on the plans or as directed by the Engineer, and in accordance with the details shown on the appropriate standard sheet.

625-2 MATERIALS

625-2.01 PROJECT SURVEY AND STAKEOUT. All stakes, reinforcing steel, 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. All reinforcing steel shall be a minimum diameter 16 mm bar, 1 meter length, and Grade 300 or 400. It shall be the Contractor's responsibility to maintain stakes in their proper position and location at all times.

625-2.02 CONCRETE RIGHT OF WAY MARKERS. Concrete right-of-way markers shall conform to the requirements of 712-05, Precast Concrete Right-of-Way Markers.

625-2.03 STEEL PIN AND CAP RIGHT-OF-WAY MARKERS.

Reinforcing steel used for the shank shall conform to ASTM A615, Grade 300 or Grade 400. It shall be epoxy coated for its entire length in accordance with the coating application requirements of 705-14 Longitudinal Joint Ties

or 709-04 Epoxy Coated Bar Reinforcement, Grade 400.

The cap shall be aluminum or a corrosion resistant aluminum alloy. The cap shall weigh a minimum of fifty grams and fasten to the shank by means of threading or force fitting.

A commercial grade Silicone Sealant shall be used between the cap and the shank. Zinc Chromate Primer, 708-04 shall be applied to all aluminum or aluminum alloy surfaces to be in contact with cement concrete.

Concrete Grouting Material 701-05 shall be used to anchor the Steel Pin and Cap Type Markers into rock.

625-2.04 PERMANENT SURVEY MARKERS. The concrete shall meet the requirements of Class A Concrete in Section 501, Portland Cement Concrete--General, except that the requirements for inspection facilities, automated batching controls and recordation do not apply. The batching, mixing and curing methods, and the inspection facilities shall meet the approval of the Department or its representative. The Contractor may submit, for approval by Director, Materials Bureau, a mix at least equivalent to the specified Class A Concrete. The cap shall be provided by the Contractor as specified by the standard sheet.

625-3 CONSTRUCTION DETAILS

625-3.01 PROJECT SURVEY AND STAKEOUT. The Contractor shall trim trees, brush and other interfering objects, not inconsistent with the plans, from survey lines in advance of all survey work to permit accurate and unimpeded work by its own stake-out survey crews and the Department's survey crews.

The location and length shown on the plans for pipe and structural plate culverts shall be considered to be approximate. The ordered length of culverts will be determined by the Engineer after the Contractor accurately stakes the proposed culvert in the planned location as approved by the Engineer and after appropriate and necessary engineering study.

The exact position of all work shall be established from survey control points which are shown on the plans and/or modified by the Engineer. Any error, apparent discrepancy or absence in or of data shown or required for accurately accomplishing the stake-out 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 center line 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 center line 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 and at the request of the Engineer. The Contractor 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 plans or specified by the Engineer.

The Contractor shall also accurately establish the center line of bearings for bridge abutments and piers, by setting special hubs or reference points as directed by the Engineer, so located and protected to insure their remaining undisturbed until such time as they are no longer needed. The Contractor shall accurately mark the location of anchor bolts to be installed, establish the elevation of bearing surfaces and check bearing plates to insure installation at their exact elevation. Before the erection of structural steel is started the Contractor shall verify by accurate field measurements the locations, both vertically and horizontally, of all bearings and shall assume full responsibility for the fabricated structural steel fitting the substructure as constructed.

All required Rights-of-Way and easement limits shall be established, staked and referenced by the Contractor concurrent with the construction stake-out survey, and prior to any construction work beginning on the affected properties. Rights of way and easement limits shall only be set, and property lines reset, by or under the direction of a Licensed Land Surveyor or exempt Professional Engineer (as permitted under Section 7209(m) of the NYS Education Law), who is licensed and registered to practice in New York State. The Contractor shall supply proof to the Engineer that such work is being performed by or supervised by a Licensed Land Surveyor or exempt Professional Engineer and all control has been established in accordance with the Department's "Surveying Standards & Procedures Manual".

Reference points, base lines, stakes and bench marks for borrow pits shall be established by the Contractor.

As specified under Section 105-10 Stakeout, and Section 107-08 Preservation of Property, the Contractor shall ensure that prior to beginning work, all existing property line and survey monuments (including right of way markers) which are adjacent to work areas and may be disturbed during construction shall be properly tied into fixed reference

points or located from prime project control, before beginning work in that area. Reference ties (3 or 4 minimum) or field location notes shall be neatly recorded and made available to the Engineer upon request. If any property line and/or survey monuments are disturbed by the Contractor, they shall be reset under this item prior to the conclusion of the contract by either reuse of the original marker or by use of reinforcing steel, as directed by the Engineer. All work connected with tying off monuments and/or resetting them shall be performed by or under the direction of a Professional Land Surveyor or exempt Professional Engineer, who is licensed and registered to practice in New York State.

Information on installed right-of-way markers and permanent survey markers shall be neatly recorded on certification forms provided by the Engineer. The permanent survey marker forms include project information, as-built State Plane Coordinate values, control line and centerline station and offset to marker, distance and direction to adjacent markers, the elevation of the marker, and a sketch which shows the relative positions to the control line points, 3 or 4 physical ties to the markers, and a north arrow. The right of way marker forms include project information and control line (proposed and as-built) station and offset to the marker. The as-built location of all markers shall be recorded to the nearest millimeter and located from prime project control to a minimum accuracy of one part in twenty thousand. These locations shall be certified by a Professional Land Surveyor or exempt Professional Engineer who is licensed to practice in New York State. The certification forms shall be delivered to the Engineer within 30 calendar days of setting the markers, which then will be forwarded to the Regional Land Surveyor.

The Contractor shall be responsible for the accuracy of the work and shall maintain all reference points, stakes, etc. throughout the life of the contract. Damaged or destroyed points, bench marks 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 (3 or 4 minimum) 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 stake-out survey work related to highway control shall be referenced to the center line shown on the plans. 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 available to the Engineer upon request and shall become the property of the State and delivered to the Engineer not later than the date of acceptance of the contract.

The Engineer may check all or any portion of the stake-out survey work or notes made by the Contractor. Any necessary correction to the work shall be made immediately by the Contractor. Such checking by the Engineer shall not relieve the Contractor of any responsibilities for the accuracy or completeness of the work.

Prior to the final cross-section survey of the project by the Engineer, the Contractor shall reestablish center line or base line points and stationing as required by the Engineer.

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

The Contractor will not be required or permitted to take the preconstruction or final cross-sections that are used for payment purposes.

During the progress of the construction work the Contractor will be required to furnish all of the surveying and stake-out 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 re-stake with pins or other acceptable hubs located directly adjacent to the work at a spacing directed by the Engineer.

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

625-3.02 RIGHT OF WAY MARKERS. The Contractor shall set right-of-way markers at the time the Engineer directs them to be placed. Placement shall be made from a closed traverse within Second-Order , Class II (1 part in 20,000) accuracy, and in accordance with the Department's "Surveying Standards & Procedures Manual". The right-of-way markers shall be set at the locations specified by the Engineer and as shown on the appropriate Right of Way Acquisition Maps. This work shall be performed by, or under the direction of, a Professional Land Surveyor or an exempt Professional Engineer who is licensed and registered to practice in New York State. The Licensed Land Surveyor or exempt Professional Engineer shall certify the as-built position of each marker on the appropriate form provided by the Engineer. The scheduling for installation of Right of Way Markers shall be approved by the Engineer prior to their installation.

Right-of-Way markers shall be installed in accordance with the Standard Sheets, these specifications, and in

accordance with the directions of the Engineer. If the Steel Pin ROW Marker is used, prior to placing the cap on the bar, the cap shall be filled 2/3 full of silicone sealant and then fastened to the bar by threading or by force fit. During the driving operation for the Steel Pin Right-of-Way Marker, the lettering on the cap shall be protected by the use of a metal sleeve or cushion block. The marker shall be driven so that the cap is flush with the ground surface.

When located in rock, right-of-way markers shall be installed as shown on the Standard Sheet. For Steel Pin Right-of-Way Markers, the surface of the aluminum cap to be in contact with the concrete grout shall be thoroughly coated with 708-04 Zinc Chromate Primer.

All right-of-way markers shall be properly guarded and flagged for easy identification during construction. The Contractor shall be responsible for maintaining and protecting right-of-way markers during construction. Any new or existing markers disturbed or damaged prior to contract acceptance shall be replaced by the Contractor at no expense to the State.

625-3.03 PERMANENT SURVEY MARKERS. The markers shall be constructed as shown on the applicable standard sheet and placed where directed by the Engineer. Upon completion of installation, the survey markers shall be located from a closed traverse within Second-Order, Class II (1 part in 20,000) accuracy, which has been established in accordance with the NYSDOT "Surveying Standards & Procedures Manual". This work shall be performed by, or under the direction of, a Professional Land Surveyor or an exempt Professional Engineer licensed and registered in New York State. The Contractor shall provide the Engineer with completed forms which are certified by a Licensed Land Surveyor or exempt Professional Engineer and which lists the precise as-built location of each survey markers. Certification forms are available from the Engineer. The scheduling for installation of Survey Markers shall be approved by the Engineer prior to their installation. The sequential numbering required on the permanent survey marker caps is to coordinated with the Engineer and the Regional Land Surveyor.

625-4 METHOD OF MEASUREMENT

625-4.01 PROJECT SURVEY AND STAKEOUT. Payment will be made at the lump sum price bid for this work. Monthly payments will be made under this work in proportion to the amount of work done as determined by the Engineer.

625-4.02 RIGHT OF WAY MARKERS. The number of right-of-way markers to be paid for under this work shall be the number placed and certified in accordance with the plans, right-of-way maps, or directions of the Engineer. Payment will be made upon proper installation of the marker, receipt of the certification form by the Engineer, and approval of the certification by the Regional Land Surveyor.

625-4.03 PERMANENT SURVEY MARKERS. The number of permanent survey markers to be paid for under this work shall be the number placed and certified, in accordance with the plans or as directed by the Engineer. Payment will be made upon proper installation of the marker, receipt of the certification form by the Engineer, and approval of the certification by the Regional Land Surveyor.

625-5 BASIS OF PAYMENT

625-5.01 PROJECT SURVEY AND STAKEOUT. The price bid shall include the cost of furnishing all labor, instruments, materials and equipment necessary to satisfactorily complete the work.

625-5.02 RIGHT OF WAY MARKERS. The unit price bid per each shall include the cost of furnishing all labor, materials and equipment necessary to satisfactorily complete the work, except that all survey control necessary for stakeout and certification shall be included under Item 625.01.

625-5.03 PERMANENT SURVEY MARKERS. The unit price bid per each shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work, except that all survey control necessary for stakeout and certification shall be included under Item 625.01.

Payment will be made under:

Item No.	Item	Pay Unit
625.01 M	Survey and Stakeout	Lump Sum
625.03 M	Concrete Right-of-Way Markers Type H (High)	Each
625.04 M	Concrete Right-of-Way Markers Type L (Low)	Each
625.05 M	Steel Pin and Cap Right-of-Way Markers	Each
625.06 M	Permanent Survey Markers	Each"

Page 6-113, line 26, ***replace*** **SECTION 626 - SURVEY MARKERS** in its entirety with "**SECTION 626 (VACANT)**"

Page 6-118, line 19, ***replace*** **SECTION 634 - MISCELLANEOUS** in its entirety with "**SECTION 634 (VACANT)**"

Page 6-124, line 36, ***add*** **637-1.04** as follows:

"**637-1.04** **Concrete Cylinder Curing Box.** This work shall consist of furnishing, prior to placement of any structural concrete, an approved concrete cylinder curing box."

Page 6-129, line 36, ***add*** **637-2.06** as follows:

"**637-2.06** **Concrete Cylinder Curing Box.** The materials shall meet the requirements of 735-01, Concrete Cylinder Curing Box."

Page 6-130, line 19, ***add*** **637-3.02** as follows:

"**637-3.02** **Concrete Cylinder Curing Box.** The Contractor shall furnish the Engineer a concrete cylinder curing box and two locks with two keys for each lock. The locks shall fit each securing latch of the curing box. This concrete cylinder curing box shall remain exclusively available to the Engineer at the location selected by the Engineer. The Contractor shall relocate to any new location directed by the Engineer, repair or replace, if necessary, paint, clean and otherwise maintain the concrete cylinder curing box for the duration of the contract. The Contractor shall also provide and maintain all necessary utility connections to operate the curing box.

The concrete cylinder curing box will remain the property of the Contractor and shall be removed from the site of the work upon completion of the contract."

Page 6-130, line 40, ***add*** **637-4.03** as follows:

"**637-4.03** **Concrete Cylinder Curing Box.** Concrete cylinder curing boxes will be measured by the number of units furnished and installed and actually used in accordance with these specifications."

Page 6-131, line 10, ***add*** **637-5.03** as follows:

"**637-5.03** **Concrete Cylinder Curing Box.** The unit price bid for each box shall include the cost of all labor, material, equipment, ground rental, relocation, repair or replacement, painting, cleaning, maintenance, and utility charges necessary for operation."

Page 6-131, line 13, ***add*** **Pay Item 637.03 M** as follows:

"637.03 M	Concrete Cylinder Curing Box	Each"