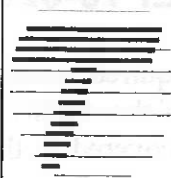


SUPERSEDED BY
EB 15-031
EFFECTIVE 9/28/15



New York State
Department of
Transportation
**ENGINEERING
INSTRUCTION**

EI
10-020

Title: **REVISIONS TO STANDARD SPECIFICATION – SECTION 646**

Distribution:

- | | |
|--|--|
| ☒ Manufacturers (18) | ☐ Surveyors (33) |
| ☒ Local Govt. (31) | ☒ Consultants (34) |
| ☒ Agencies (32) | ☒ Contractors (39) |
| | ☐ _____ () |

Approved:

Robert Sack, PE
Deputy Chief Engineer, Research

20 July 10
Date

ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective with projects submitted for the letting of 1/6/11.
- No issuances are superseded.
- The attached shelf notes will be incorporated into the next revision of the Standard Specifications.

PURPOSE: To transmit revised Standard Specification *Section 646 Delineators, Reference Markers and Snowplowing Markers*.

TECHNICAL INFORMATION:

- Revisions to Section 646 of the Standard Specifications include the following:
 1. Reference to aluminum alloy 6061-T6 has been removed due to the fact that any aluminum alloy as listed in §730-01 Aluminum Sign Panels would be acceptable.
 2. The use of fluorescent yellow Type IX retro-reflective sheeting is now mandatory for left side delineators. Fluorescent colors have been found to be more visible than standard colors and thus provide better delineation.
 3. Acrylic plastic reflex reflectors for delineators are no longer acceptable.
 4. A new item number for Large Delineator, Large Snowplowing Marker, and Large Supplementary Snowplowing Marker Panels has been created.
 5. Items for panels, posts and mounting brackets for multidirectional mounting and mounting on concrete barriers have been separated and assigned individual item numbers.
 6. Item numbers for standard delineator, snowplow marker and supplemental snowplow marker panels have been condensed into one item number.
- This EI is being issued concurrently with EB 10-020.
- Recommended usage:
 - Large Delineators: freeways, expressways
 - Standard Delineators: parkways, conventional highways
- The new series of item numbers will provide designers with more flexibility in specifying various configurations for these items. Flexible delineators will be specified by type: one way, back-to-back or double. Other delineator items will be specified as a post item and a separate panel item. For multiple directional configurations, a post item, panel item and a bracket item must be specified. A single post may have multiple panels and/or brackets. For items mounted on barriers, wall or other situations where a special mounting bracket is required, a panel item and a bracket item must be specified. The cost for mounting hardware for all situations, including pole mounted

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items where a band may be required, is included in the cost of the panel. The contract documents must provide a detailed list of the required item quantities and configurations, including bracket designs and post lengths not covered in the 646 Standard Sheets, as well as sheeting colors and legends.

IMPLEMENTATION:

- The Design Quality Assurance Bureau will insert the standard specification shelf note into contract proposals beginning with projects submitted for the letting of 1/6/11.
- This EI disapproves the following contract pay items:

646.0601	646.0607	646.06080201	646.0701
646.06010101	646.06030025	646.0609	646.07010106
646.06010103	646.06030106	646.06090101	646.0702
646.06010106	646.06030203	646.06090201	646.0703
646.06010201	646.06030206	646.0610	646.0704
646.06010203	646.0604	646.06100025	646.0705
646.06010206	646.06040025	646.0611	646.0801
646.06010303	646.06040203	646.0612	646.08010025
646.06010403	646.06040206	646.06120005	646.08010106
646.06010503	646.0605	646.06120025	646.0802
646.0602	646.0606	646.0623	646.08020025
646.06020101	646.06060101	646.0624	646.0803
646.06020201	646.06060201	646.0625	646.08030106
646.06030103	646.06070201	646.0633	646.08030206
646.0603	646.0608	646.0634	646.08040106
646.06030005	646.06080101	646.0635	646.08040106
			646.09

TRANSMITTED MATERIALS:

- Both Metric and US Customary shelf notes revising Section 646 of the Standard Specification are attached.

CONTACT: Questions regarding policy and use can be directed to Sally Olsen of the Office of Traffic Safety and Mobility at (518) 457-5690 or at solsen@dot.state.ny.us. Questions regarding materials used in the transmitted specification can be directed to Patrick Galarza of the Materials Bureau at (518) 457-4599 or pgalarza@dot.state.ny.us.

DELINEATORS, REFERENCE MARKERS AND SNOWPLOW MARKERS

Make the following changes to the Standard Specifications of May 1, 2008 US Customary Units:

Page 661 thru 663 Delete Section 646 - DELINEATORS, REFERENCE MARKERS AND SNOWPLOWING MARKERS in its entirety, and **Replace** it with the following: **"SECTION 646 - DELINEATORS, REFERENCE MARKERS AND SNOWPLOWING MARKERS**

646-1 DESCRIPTION. Furnish and install delineators, reference markers and snowplowing markers in accordance with the MUTCD, contract documents and as directed by the Engineer.

646-1.01 Delineators. Delineators are retroreflective sheeting applied to panels mounted on posts or applied to flexible units, which are installed along the highway to serve as driving aids.

646-1.02 Reference Markers. Reference markers are panels with a legend, placed at approximately 528 ft (1/10 mile) intervals along the highway, to provide a numerical location reference.

646-1.03 Snowplowing Markers and Supplementary Snowplowing Markers. Snowplowing markers and supplementary snowplowing markers are reflective units installed along the highway to identify guiderail sections for snowplow operators.

646-2 MATERIALS.

Galvanized Coating and Repair Methods	719-01
Aluminum Sign Panels	730-01
Reflective Sheeting	730-05
Delineator, Reference Marker and Snowplowing Marker Posts	730-20
Flexible Delineator Posts	730-21
Stiffeners, Overhead Brackets and Miscellaneous Hardware	730-22

646-2.01 Posts. Galvanized steel posts as shown on the standard sheets and used for mounting panels.

646-2.02 Panels. Panels for backing of retro-reflective sheeting and installed on a post or other structure. Holes may be punched or drilled. Edges shall be smooth and true and free from burrs or ragged breaks. Panels shall be fabricated as shown on the standard sheets.

646-2.03 Flexible Delineator Posts. Plastic or other polymer units with retroreflective sheeting applied directly to the surface of the flexible delineator and installed directly along a highway.

646-2.04 Retro-Reflective Material.

Delineators	730-05.05 ASTM Type IX (Class E)
Snowplowing Markers, Supplementary Snowplowing Markers, and Reference Markers	730-05.02 ASTM Type III (Class B), 730-05.03 ASTM Type V (Class C) or 730-05.05 ASTM Type IX (Class E)

On any one contract all of the delineators must be fabricated from the same material, all of the snowplowing markers and supplementary snowplowing markers must be fabricated from the same material and all of the reference markers must be fabricated from the same material but the material may differ between the delineators, the snowplowing markers, the supplementary snowplowing markers and the reference markers.

646-2.05 Fasteners. Stainless steel, galvanized steel or aluminum as shown on the standard sheets.

646-2.06 Brackets. Aluminum alloy, galvanized steel or polycarbonate as shown on the standard sheets.

646-2.07 Corrosion Protection.

Provide and use either an approved mastic or 1/8 inch thick plastic pad placed between aluminum and steel to prevent dissimilar metals from coming in direct contact with each other.

646-3 CONSTRUCTION DETAILS

646-3.01 Fabrication. Delineators, reference markers, snowplowing markers, and supplementary snowplowing markers fabricated as shown on the standard sheets. Fabricate reference markers with legend content as shown on the contract documents.

646-3.02 Installation. Install at the locations and spacing as shown on the contract documents or as ordered by the Engineer. Directional orientation, arrangement, number and color of reflector units, at any given location shall be as shown on the contract documents.

Install reference markers at approximately 528 ft (1/10 mile) intervals along the highway on new construction, at existing locations for replacement units, or as ordered by the Engineer. The Contractor will be given the location of each marker.

Install flexible delineator posts as per the manufacturer's recommendations and as directed by the Engineer.

Erect delineator, reference marker and snowplowing/supplemental snowplowing marker panels on posts, brackets, existing posts and structures in the manner shown on the standard sheets.

After the installation, an inspection by the Engineer will be made in the day time for proper location, line and grade, vertical post alignment and visibility. A night inspection will also be performed to evaluate orientation, retroreflectivity and defects more conspicuous at night. Correct all apparent defects disclosed after the day and night inspections at no additional cost to the State

When panels are installed on walls, bridges, existing posts, poles or structures, do not damage the appearance or structural features of the existing facilities. Repair or replace all damaged features to the satisfaction of the Engineer and at no additional cost to the State.

646-3.03 Panel Relocation. Carefully remove panels to be relocated and stockpile them in a safe above ground location as shown in the Contract documents or at a location satisfactory to the Engineer. Protect the panels, including the retroreflective sheeting, from damage. Replace all damaged panels at no cost to the State.

Remove and dispose of all existing posts and/or hardware used only for the support of the existing panels. Removed posts shall become the property of the Contractor and shall be removed from the work site in a neat and skillful manner.

Re-erect relocated panels on new posts, brackets, or bands at the locations specified in the contract documents or as directed by the Engineer.

646-4 METHOD OF MEASUREMENT. Delineators, reference markers, snowplowing markers, supplementary snowplowing markers, flexible delineator posts, posts and brackets will be measured as the number of complete panels, brackets and posts installed. In the event a section of highway is under construction by others and reference markers cannot be installed, they will be measured as the number of marker panels and posts furnished only. Relocated panels will be measured as the number of panels relocated.

646-5 BASIS OF PAYMENT. The unit price bid shall include the cost of all materials, equipment and labor necessary to satisfactorily complete the work. Cost of mounting hardware will be included with the cost of the panels.

Payment will be made under:

Item No.	Item	Pay Unit
646.21	Reference Marker Panel	Each
646.22	Delineator, Snowplowing Marker, Supplementary Snowplowing Marker Panels	Each
646.23	Large Delineator, Large Snowplowing Marker, Large Supplementary Snowplowing Marker Panel	Each
646.24	Reference Marker, Delineator, Snowplowing Marker, Supplementary Snowplowing Marker Panels Relocation	Each
646.31	Steel Post, 1.1 lb/ft	Each
646.32	Steel Post, 2.0 lb/ft	Each
646.40	Flexible Delineator, Single Unit, One Way	Each
646.41	Flexible Delineator, Single Unit, Back to Back	Each
646.42	Flexible Delineator, Double Unit	Each
646.50	Brackets for Barrier and Multidirectional Mounting	Each"

DELINEATORS, REFERENCE MARKERS AND SNOWPLOW MARKERS

Make the following changes to the Standard Specifications of May 4, 2006 Metric Units:

Page 633 thru 635 Delete Section 646 - DELINEATORS, REFERENCE MARKERS AND SNOWPLOWING MARKERS in its entirety, and **Replace** it with the following: **"SECTION 646 - DELINEATORS, REFERENCE MARKERS AND SNOWPLOWING MARKERS**

646-1 DESCRIPTION. Furnish and install delineators, reference markers and snowplowing markers in accordance with the MUTCD, contract documents and as ordered by the Engineer.

646-1.01 Delineators. Delineators are reflective units placed on supports along the highway to serve as driving aids.

646-1.02 Reference Markers. Reference markers are panels with a legend, placed at approximately 161 meter intervals along the highway, to provide a numerical location reference.

646-1.03 Snowplowing Markers and Supplementary Snowplowing Markers. Snowplowing markers and supplementary snowplowing markers are reflective units installed along the highway to identify guiderail sections for snowplow operators.

646-2 MATERIALS.

Galvanized Coating and Repair Methods	719-01
Aluminum Sign Panels	730-01
Reflective Sheeting	730-05
Delineator, Reference Marker and Snowplowing Marker Posts	730-20
Flexible Delineator Posts	730-21
Stiffeners, Overhead Brackets and Miscellaneous Hardware	730-22

646-2.01 Posts. Galvanized steel as shown on the standard sheets and/or contract documents, or an approved flexible post meeting the requirements of §730-21 Flexible Delineator Posts.

646-2.02 Panels. Aluminum panels for backing of retro-reflective sheeting. Holes may be punched or drilled. Edges shall be smooth and true and free from burrs or ragged breaks. Panels shall be fabricated as shown on the standard sheets.

646-2.03 Flexible Delineator Posts. Plastic or other polymer units with retroreflective sheeting applied directly to the surface of the flexible delineator and installed directly along a highway.

646-2.04 Retro-Reflective Material.

Delineators	730-05.05 ASTM Type IX (Class E)
Snowplowing Markers, Supplementary Snowplowing Markers, and Reference Markers	730-05.02 ASTM Type III (Class B), 730-05.03 ASTM Type V (Class C) or 730-05.05 ASTM Type IX (Class E)

On any one contract all of the delineators must be fabricated from the same material, all of the snowplowing markers and supplementary snowplowing markers must be fabricated from the same material and all of the reference markers must be fabricated from the same material but the material may differ between the delineators, the snowplowing markers, the supplementary snowplowing markers and the reference markers.

646-2.05 Fasteners. Stainless steel, galvanized steel or aluminum as shown on the standard sheets.

646-2.06 Brackets. Aluminum alloy, galvanized steel or polycarbonate as shown on the standard sheets.

646-2.07 Corrosion Protection.

Provide and use either an approved mastic or 3 mm thick plastic pad placed between aluminum and steel to prevent dissimilar metals from coming in direct contact with each other.

646-3 CONSTRUCTION DETAILS

646-3.01 Fabrication. Delineators, reference markers, snowplowing markers, and supplementary snowplowing markers fabricated as shown on the standard sheets. Fabricate reference markers with legend content as shown on the contract documents.

646-3.02 Installation. Install at the locations and spacing as shown on the contract documents or as ordered by the Engineer. Directional orientation, arrangement, number and color of reflector units, at any given location shall be as shown on the contract documents.

Install reference markers at approximately 161 meter intervals along the highway on new construction, at existing locations for replacement units, or as ordered by the Engineer. The Contractor will be given the location of each marker.

Install flexible delineator posts as per the manufacturer's recommendations and as directed by the Engineer.

Erect delineator, reference marker and snowplowing/supplemental snowplowing marker panels on posts, brackets, existing posts and structures in the manner shown on the standard sheets.

After the installation, an inspection by the Engineer will be made in the day time for proper location, line and grade, vertical post alignment and visibility. A night inspection will also be performed to evaluate orientation, retroreflectivity and defects more conspicuous at night. Correct all apparent defects disclosed after the day and night inspections at no additional cost to the State

When panels are installed on walls, bridges, existing posts, poles or structures, do not damage the appearance or structural features of the existing facilities. Repair or replace all damaged features to the satisfaction of the Engineer and at no additional cost to the State.

646-3.03 Panel Relocation. Carefully remove panels to be relocated and stockpile them in a safe above ground location as shown in the Contract documents or at a location satisfactory to the Engineer. Protect the panels, including the retroreflective sheeting, from damage. Replace all damaged panels at no cost to the State.

Remove and dispose of all existing posts and/or hardware used only for the support of the existing panels. Removed posts shall become the property of the Contractor and shall be removed from the work site in a neat and skillful manner.

Re-erect relocated panels on new posts, brackets, or bands at the locations specified in the contract documents or as directed by the Engineer.

646-4 METHOD OF MEASUREMENT. Delineators, reference markers, snowplowing panels, supplementary snowplowing markers, flexible delineator posts, posts and brackets will be measured as the number of complete panels, brackets and posts installed. In the event a section of highway is under construction by others and reference markers cannot be installed, they will be measured as the number of marker panels and posts furnished only. Relocated panels will be measured as the number of panels relocated.

646-5 BASIS OF PAYMENT. The unit price bid shall include the cost of all materials, equipment and labor necessary to satisfactorily complete the work. Cost of mounting hardware will be included with the cost of the panels.

Payment will be made under:

Item No.	Item	Pay Unit
646.21	Reference Marker Panel	Each
646.22	Delineator, Snowplowing Marker, Supplementary Snowplowing Marker Panels	Each
646.23	Large Delineator, Large Snowplowing Marker, Large Supplementary Snowplowing Marker Panel	Each
646.24	Reference Marker, Delineator, Snowplowing Marker, Supplementary Snowplowing Marker Panels Relocation	Each
646.31	Steel Post, 1.6 kg/m	Each
646.32	Steel Post, 3.0kg/m	Each
646.40	Flexible Delineator, Single Unit, One Way on Flexible Post	Each
646.41	Flexible Delineator, Single Unit, Back to Back, on Flexible Post	Each
646.42	Flexible Delineator, Double Unit on Flexible Post	Each
646.50	Brackets for Barrier and Multidirectional Mounting	Each"