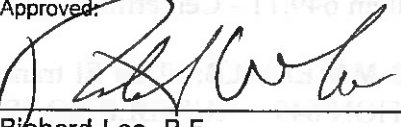


1 SUPERSEDED BY EB 15-031 EFFECTIVE 9/28/15		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 10-029
Title: NEW STANDARD SPECIFICATION SECTION 649 - AUDIBLE ROADWAY DELINEATORS			
Distribution: ☐ Manufacturers (18) ☒ Local Govt. (31) ☒ Agencies (32) ☐ Surveyors (33) ☒ Consultants (34) ☒ Contractors (39) ☐ _____ ()		Approved:  Richard Lee, P.E. Acting Deputy Chief Engineer, Design Date <u>8/31/10</u>	

ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of 1/6/2011.
- The revisions issued with this EI will be incorporated into a future update of the Standard Specifications.
- Superseded Issuances: none.

PURPOSE: To transmit revisions to the Standard Specifications which issue new Standard Specification Section 649 - Audible Roadway Delineators.

TECHNICAL INFORMATION:

- Guidance for designers on the use of centerline audible roadway delineators (CARDS) is being issued under EI 10-030 *Rumble Strips - Centerline Audible Roadway Delineators (CARDS) - Guidance and Policy*. Also being issued concurrently is EB 10-037 *Standard Sheets 649-01 and M649-01 - Audible Roadway Delineators*.
- Design Guidance for Milled-In Audible Roadway Delineators (MIARDs) is available in Chapter 3 of the Highway Design Manual.

IMPLEMENTATION: Main Office Design Quality Assurance Bureau will insert the Standard Specification revisions into contract proposals beginning with projects submitted for the letting of January 6, 2011.

- The following special specifications are disapproved:

Metric

- Item 646.10----14 Milled-In Audible Roadway Delineators (MIARD)
- Item 646.10----91 Centerline Audible Roadway Delineators (CARD)
- Item 646.11----14 Rolled-In Audible Roadway Delineators (RIARD)
- Item 646.12----14 Formed-In Narrow Audible Roadway Delineators (FINARD)
- Item 646.13----14 Formed-In Corrugated Audible Roadway Delineators (FICARD)
- Item 646.14----14 Milled-In Rumble Strips (MIRS)

U.S. Customary

- Item 646.10000014 Milled-In Audible Roadway Delineators (MIARD)
- Item 646.10000091 Centerline Audible Roadway Delineators (CARD)
- Item 646.12000014 Formed-In Narrow Audible Roadway Delineators (FINARD)
- Item 646.14000011 Milled-In Rumble Strips (MIRS)

- The following new standard specifications are available for use:
Metric and U.S. Customary
 - Item 649.01 - Milled-In Audible Road Delineators (MIARDs)
 - Item 649.11 - Centerline Audible Road Delineators (CARDs)

TRANSMITTED MATERIALS: This EI transmits both US Customary and metric standard specification revisions, SECTION 649 – AUDIBLE ROADWAY DELINEATORS.

BACKGROUND: Refer to EI 10-030 *Rumble Strips – Centerline Audible Roadway Delineators (CARDs) – Guidance and Policy* for additional background information.

CONTACT: Direct questions regarding this issuance to Richard Lee at rleel@dot.state.ny.us.

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

Delete Section 649 (VACANT) and **replace** with the following:

SECTION 649 – AUDIBLE ROADWAY DELINEATORS

649-1 DESCRIPTION. Audible delineators are depressions placed on the road surface to serve as driving aids. This work shall consist of installing audible roadway delineators where indicated on the contract documents.

649-2 MATERIALS. None specified.

649-3 CONSTRUCTION DETAILS

Milled-In Audible Roadway Delineators (MIARDs).

A. Equipment. The construction equipment shall include a rotary type cutting head capable of cutting the MIARD depressions to the dimensions and at the spacing indicated on the Standard Sheets. The pattern of cutting tips on the head shall be arranged to produce a relatively smooth cut with approximately 1/16 inch between peaks and valleys. Prior to beginning full production work on asphalt shoulders, the Contractor shall demonstrate to the Engineer the ability to achieve the desired surface without tearing or snagging the asphalt to be milled.

The cutting head shall be on its own suspension system, independent from that of the power unit, to allow the head to align itself with the slope of the shoulder and/or any irregularities in the shoulder surface. The cutting tool shall be equipped with guides or a guidance system, clearly visible to the operator, to provide for consistent alignment of each MIARD at the offsets from traveled way indicated on the project plans. Where directed by the Plans or EIC to mill in MIARDs in areas marked with crosshatching, the spacing of the MIARDs shall be adjusted to minimize damage to the markings. No milling shall be done within 4 inches of transverse joints.

B. Installation and Dimensions. The finished MIARDs shall conform to the dimensions and spacing shown on the Standard Sheets. The milling machine shall be capable of grinding to within 3 feet of an obstruction. The offset from traveled way may be changed at the EIC's discretion.

At the end of each working day, the Contractor shall remove all equipment to a location where it does not present a hazard to traffic. The pavement shall be cleaned by sweeping and the work area shall be reopened to traffic. The milled material shall be thoroughly removed from the shoulders. In uncurbed areas, the millings may be swept off the shoulder to serve as shoulder back-up material. In curbed areas, millings shall be removed from the project and disposed of in an acceptable manner.

Centerline Audible Roadway Delineators (CARDs).

A. Scheduling and Coordination. Because of the need to promptly replace pavement markings and reopen the highway to traffic, milling of CARDs shall not be conducted when conditions would not allow pavement markings to be placed soon after. To facilitate prompt placement of pavement markings by either the Department's pavement marking crews or the Contractor as indicated in the contract documents, all work shall be done between April 1 and November 30 Downstate (in the counties of Dutchess, Orange,

Rockland, Putman, Westchester, Nassau, Suffolk, and the City of New York) and between May 1 and October 31 Upstate (all other counties). If the contract documents indicate that pavement markings will be installed by the Department, the Contractor shall inform the Engineer of the planned work schedule and the Engineer will coordinate with the Department's pavement marking crew chief. If the contract documents indicate that pavement markings will be installed by the Contractor, pavement markings shall be installed within three calendar days, measuring from the date on which the markings at that point were first removed.

Gaps: Prior to milling, the Contractor shall obtain EIC approval on where CARDS are to be installed and where gaps are to be included.

- B. Timing of CARD Placements.** New asphalt pavement should be allowed to harden for at least 24 hours before CARDS are milled in, so that the milling machine does not tear the asphalt and so that asphalt does not build up on the cutters. Temporary Pavement Markings, in conformance with Section 619-3.06, shall be installed during this hardening period. If tape is used, it shall be removed before milling commences. After the CARDS have been milled and the millings have been removed, the permanent pavement markings can be installed.
- C. Equipment.** The construction equipment shall include a rotary type cutting head capable of cutting the CARD depressions to the dimensions and at the spacing indicated on the Standard Sheets. The pattern of cutting tips on the head shall be arranged to produce a relatively smooth cut with approximately 1/16 inch between peaks and valleys. Prior to beginning full production work, the contractor shall demonstrate to the Engineer the ability to achieve the desired surface without tearing or snagging the asphalt.

The cutting head shall be on its own suspension system, independent from that of the power unit, to allow the head to align itself with the slope of the pavement and/or any irregularities in the surface. The cutting tool shall be equipped with guides or a guidance system, clearly visible to the operator, to provide for consistent alignment of each CARD relative to the centerline markings.

- D. Installation and Dimensions.** The Contractor shall provide Maintenance and Protection of Traffic as indicated in the contract documents.

CARDs shall be installed within the limits indicated in the contract documents. Unless indicated otherwise in the contract documents, CARDs shall be centered on the middle of the centerline marking pattern. No milling shall be done within 4 inches of sawn and sealed transverse joints. CARDs shall not be carried through any intersection where the CARD's direction of travel is controlled by a yield sign, stop sign, or traffic light, or would encounter crosswalks. In those instances, the CARD shall stop before any stop line or crosswalk. CARDs shall not be carried through any crosswalks or across any concrete bridge deck or concrete culvert surface. Treatment for left turn lanes shall be as shown on the Standard Sheets.

At the end of each working day, the Contractor shall remove all equipment to a location where it does not present a hazard to traffic. The pavement shall be cleaned by sweeping and the work area shall be reopened to traffic. Millings shall be thoroughly removed from the work area and disposed of in an acceptable manner.

649-4 METHOD OF MEASUREMENT. Audible Roadway Delineators will be measured as the sum of the lengths in linear feet of the individual segments where audible roadway delineators have been satisfactorily installed. Individual gaps and exclusions under 100 feet in length will be included in segments identified for payment. Individual gaps and exclusions 100 feet or more in length will be excluded from segments identified for payment.

For milled-in audible roadway delineators, lengths will be measured along the inside edge of the shoulder from the center of the first milled-in audible roadway delineator in a segment to the center of the last milled-in audible roadway delineator in that segment. Where milled-in audible roadway delineators are provided on more than one shoulder, lengths will be measured separately for each segment and added to the sum.

For centerline audible roadway delineators, lengths will be measured along the centerline of the CARDS from the center of the first centerline audible roadway delineator in a segment to the center of the last centerline audible roadway delineator in that segment.

649-5 BASIS OF PAYMENT. The unit price bid shall include the cost of all materials, equipment and labor necessary to satisfactorily complete the work.

Payment will be made under:

Item No.	Item	Pay Unit
649.01	Milled-In Audible Road Delineators (MIARDs)	Linear Foot
649.11	Centerline Audible Road Delineators (CARDS)	Linear Foot

Make the following changes to the Standard Specification of May 4, 2006:

Delete Section 649 (VACANT) and **replace** with the following:

SECTION 649 – AUDIBLE ROADWAY DELINEATORS

649-1 DESCRIPTION. Audible delineators are depressions placed on the road surface to serve as driving aids. This work shall consist of installing audible roadway delineators where indicated on the contract documents.

649-2 MATERIALS. None specified.

649-3 CONSTRUCTION DETAILS

Milled-In Audible Roadway Delineators (MIARDs).

A. Equipment. The construction equipment shall include a rotary type cutting head capable of cutting the MIARD depressions to the dimensions and at the spacing indicated on the Standard Sheets. The pattern of cutting tips on the head shall be arranged to produce a relatively smooth cut with approximately 1.5 mm between peaks and valleys. Prior to beginning full production work on asphalt shoulders, the Contractor shall demonstrate to the Engineer the ability to achieve the desired surface without tearing or snagging the asphalt to be milled.

The cutting head shall be on its own suspension system, independent from that of the power unit, to allow the head to align itself with the slope of the shoulder and/or any irregularities in the shoulder surface. The cutting tool shall be equipped with guides or a guidance system, clearly visible to the operator, to provide for consistent alignment of each MIARD at the offsets from traveled way indicated on the project plans. Where directed by the Plans or EIC to mill in MIARDs in areas marked with crosshatching, the spacing of the MIARDs shall be adjusted to minimize damage to the markings. No milling shall be done within 100 mm of transverse joints.

B. Installation and Dimensions. The finished MIARDs shall conform to the dimensions and spacing shown on the Standard Sheets. The milling machine shall be capable of grinding to within 0.9 m of an obstruction. The offset from traveled way may be changed at the EIC's discretion.

At the end of each working day, the Contractor shall remove all equipment to a location where it does not present a hazard to traffic. The pavement shall be cleaned by sweeping and the work area shall be reopened to traffic. The milled material shall be thoroughly removed from the shoulders. In uncurbed areas, the millings may be swept off the shoulder to serve as shoulder back-up material. In curbed areas, millings shall be removed from the project and disposed of in an acceptable manner.

Centerline Audible Roadway Delineators (CARDs).

A. Scheduling and Coordination. Because of the need to promptly replace pavement markings and reopen the highway to traffic, milling of CARDs shall not be conducted when conditions would not allow pavement markings to be placed soon after. To facilitate prompt placement of pavement markings by either the Department's pavement marking crews or the Contractor as indicated in the contract documents, all work shall be done between April 1 and November 30 Downstate (in the counties of

Dutchess, Orange, Rockland, Putnam, Westchester, Nassau, Suffolk, and the City of New York) and between May 1 and October 31 Upstate (all other counties). If the contract documents indicate that pavement markings will be installed by the Department, the Contractor shall inform the Engineer of the planned work schedule and the Engineer will coordinate with the Department's pavement marking crew chief. If the contract documents indicate that pavement markings will be installed by the Contractor, pavement markings shall be installed within three calendar days, measuring from the date on which the markings at that point were first removed.

Gaps: Prior to milling, the Contractor shall obtain EIC approval on where CARDS are to be installed and where required gaps are to be included.

B. Timing of CARD Placements. New asphalt pavement should be allowed to harden for at least 24 hours before CARDS are milled in, so that the milling machine does not tear the asphalt and so that asphalt does not build up on the cutters. Temporary Pavement Markings, in conformance with Section 619-3.06, shall be installed during this hardening period. If tape is used, it shall be removed before milling commences. After the CARDS have been milled and the millings have been removed, the permanent pavement markings can be installed.

C. Equipment. The construction equipment shall include a rotary type cutting head capable of cutting the CARD depressions to the dimensions and at the spacing indicated on the Standard Sheets. The pattern of cutting tips on the head shall be arranged to produce a relatively smooth cut with approximately 1.5 mm between peaks and valleys. Prior to beginning full production work, the contractor shall demonstrate to the Engineer the ability to achieve the desired surface without tearing or snagging the asphalt.

The cutting head shall be on its own suspension system, independent from that of the power unit, to allow the head to align itself with the slope of the pavement and/or any irregularities in the surface. The cutting tool shall be equipped with guides or a guidance system, clearly visible to the operator, to provide for consistent alignment of each CARD relative to the centerline markings.

D. Installation and Dimensions. The Contractor shall provide Maintenance and Protection of Traffic as indicated in the contract documents.

CARDS shall be installed within the limits indicated in the contract documents. Unless indicated otherwise in the contract documents, CARDS shall be centered on the middle of the centerline marking pattern. No milling shall be done within 100 mm of sawn and sealed transverse joints. CARDS shall not be carried through any intersection where the CARD's direction of travel is controlled by a yield sign, stop sign, or traffic light, or would encounter crosswalks. In those instances, the CARD shall stop before any stop line or crosswalk. CARDS shall not be carried through any crosswalks or across any concrete bridge deck or concrete culvert surface. Treatment for left turn lanes shall be as shown on the Standard Sheets.

At the end of each working day, the Contractor shall remove all equipment to a location where it does not present a hazard to traffic. The pavement shall be cleaned by sweeping and the work area shall be reopened to traffic. Millings shall be thoroughly removed from the work area and disposed of in an acceptable manner.

649-4 METHOD OF MEASUREMENT. Audible Roadway Delineators will be measured as the sum of the lengths in linear meters of the individual segments where audible roadway delineators have been satisfactorily installed. Individual gaps and exclusions under 30 meters in length will be included in segments identified for payment. Individual gaps and exclusions 30 meters or more in length will be excluded from segments identified for payment.

For milled-in audible roadway delineators, lengths will be measured along the inside edge of the shoulder from the center of the first milled-in audible roadway delineator in a segment to the center of the last milled-in audible roadway delineator in that segment. Where milled-in audible roadway delineators are provided on more than one shoulder, lengths will be measured separately for each segment and added to the sum.

For centerline audible roadway delineators, lengths will be measured along the centerline of the CARDS from the center of the first centerline audible roadway delineator in a segment to the center of the last centerline audible roadway delineator in that segment.

649-5 BASIS OF PAYMENT. The unit price bid shall include the cost of all materials, equipment and labor necessary to satisfactorily complete the work.

Payment will be made under:

Item No.	Item	Pay Unit
649.01	Milled-In Audible Road Delineators (MIARDs)	meter
649.11	Centerline Audible Road Delineators (CARDS)	meter