

9930000 HIGHWAY DELINEATORS
COMMENTS AND RESPONSES FROM INDUSTRY REVIEW

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Comments:

For the high performance delineator, can the base be specified to have reflective sheeting? This would be useful in instances where the post has been knocked off and not yet replaced.

Response:

The shapes of the bases precludes installation of reflective sheeting material.

Eddy L. Scott
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Specifications / Design Review
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Comments:

I have the following comments about the above specs:

993-2.1 General: Delineators shall be classified into three types separated into three classes: recycled flexible post delineators, nonflexible post delineators, high visibility median separator delineators, and high performance delineators. This change is to differentiate between the types of delineators in the MUTCD and section 993-1. Also because different delineators have been traditionally paid for with separate pay items suggest we tell designers to show the type and class of delineator in the plans. This should probably be in the BOE and/or the PPM. The all Design Standards that reference delineators should be updated to reflect these changes as well. It would also be helpful to Design to provide guidance as to when to call for the recycled flexible post delineators vs. the high visibility median separator delineators.

I appreciate the opportunity to comment.

Response:

The Basis of Estimates Manual breakdown of the pay items allows the designers to differentiate between what is required. We will add guidance in the BOE when to use high visibility median separator delineators and high performance delineators.

Ray Haverty
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Comments:

Comments for Specification 9930000:

In this section below the "three types:" should be "four types:" as I read this. Section 993-2 Delineators. 993-2.1 General: Delineators shall be classified into three types: recycled flexible post delineators, nonflexible post delineators, high visibility median separator delineators, and high performance delineators.

Response:

You are correct. The sentence has been revised to indicate four types.

John Previte
D1 Specifications Engineer
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Comments:

A small thing: Specs book has various ways of expressing area. May we standardize? For example: in tables: (in²), in text: (square inches)

Response:

Corrected.

Thomas Bowles
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Comments:

There they go again. Off on a wild expedition to re-invent the wheel. Surely there are better things on which to spend our shrinking budgets!!

Response:

The new specifications are in response to comments from maintenance that a better delineator is needed in many areas.

Kent Kekeis
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Comments:

Chester, I'm just going to list out the items. Please call to discuss if you need clarification.
Best Regards,
Kent Kekeis,

Safe-Hit Market Manager.

1. (993-1.3) I'm not aware of a Type IV reflective tape. We regularly use Type III & V.
2. (993-2.3) In general, Safe-Hit is opposed to any use of a non-flexible delineator for use on highways. We believe the steel posts pose a very significant danger to the motoring public.
3. (993-2.4.1) Dimensions. We believe that for uniformity and long life that the post of the High Visibility Median Separator Delineators should be aligned with the top of the sign panel or 48", not the 42" listed. We also believe the post should be 3-1/2" diameter so that if the sign panel(s) break loose, there is still a sizable significant delineator in place.
4. (993-2.4.2) Post Base. You specify that the base be capable of withstanding one hundred vehicle impacts without damage. This does not specify the test conditions. We believe the test should be done with the post properly installed. The post could be replaced as the test progresses to the 100 vehicle impacts because I believe you are trying to ensure the base remains over many post lives. We assume this will be a wheel over test.
5. (993-2.4.4) Impact Performance. For such a large sign system, we have had very good and consistent test performance at 35mph. We do have systems that survive at 55mph for 25 impacts but the consistency of results is not as good. The difference in kinetic energy between 35 & 55mph is great. Also, you may wish to add both bumper impacts as well as wheel over impacts to the testing requirements.
6. (993.2.5.1) Dimensions. We believe that the larger the post, the better the visibility. We have a 3-1/2" diameter delineator that sets itself apart from the normal 3" workzone posts out there. They look bigger and bulkier. I'm assuming that these High Performance Delineators will be used in places that require both higher performance and establish a slightly larger "bollard" type look than a standard, so as to visually discourage drivers from thinking they can

hit them without consequence. Therefore, a 3-1/2" minimum diameter post, as viewed from all directions, would be more appropriate.

7. (993.2.5.2) see 993.2.4.2 above.

8. (993.2.5.2) Reflective sheeting should be Type 5 abrasion resistant sheeting not type IV.

9. (993.2.5.3) Impact Performance. We are confident we can achieve 100 impacts at 55mph but we are not sure how consistently we can hit the 100 impact mark. A slower speed of 45mph (100 impacts) or a reduction of impacts to 75 impacts at 55mph would also make us very confident of consistently meeting the requirements. Also, are these bumper or wheel over impacts. (Wheel over is much more abusive.)

Response:

Item 1. The reflective sheeting in Section 993-1.3 is for object markers which is always a rigid surface. There was a typo however, the Type V should have been Type VI.

Item 2. The nonflexible delineators meet the requirements of NCHRP 350. In some ramp areas where trucks park on the shoulder flexible delineators will not work.

Item 3. Not all manufacturer's utilize a post system, some have a paddle type panel that mounts directly to the base.

Item 4. NTPEP criteria will be used with the exception of temperature.

Item 5. The requirement has been changed from twenty five hits to ten hits based on NTPEP which uses 55 mph and a combination of bumper and wheel over tests.

Item 6. We are not requiring larger posts, just posts with better survivability.

Item 7. See response to item 4.

Item 8. You are correct, the Type should have been Type V.

Item 9. We have reduced the number of impacts from one hundred to fifty impacts.

Matthew Schindler
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Comments:

Information below specifically pertains to section 993-2.4 High Visibility Median Separator delineators:

We distribute a product (Bullnose marker as manufactured by Qwick Kurb, Inc) that meets the intent of this specification which FDOT currently has on a trial site in Tallahassee at the request of the Office of Roadway Design. Attached is a sample picture of the device.

The purpose of this device is to add target value to the concrete island so drivers are less likely to hit the island at night. The true test of whether or not the product is effective

(i.e. “it works”) is performance based – put it out on a location with known impacts (where the existing glue down tube is frequently replaced) and see how the device works. Does it look like the island is being hit less? Is the device being replaced frequently? It could be a safe assumption that devices with the minimum required reflectivity in the draft spec would have similar effects on drivers.

This draft specification resembles the material requirements of the glue down flexible delineator tubes. In fact, these high visibility markers are much larger than glue down tubes. The device you are testing of mine is at 40” from the top of the marker to the bottom of the base. Suggest changing 993-2.4.1 to 41” above surface of separator to account for my product you are testing. At 41” tall, my device is holding 232 square inches of reflective sheeting on each side. The specification does not address the general shape of the device, but in order to get that much reflectivity, it would need to be a panel type shape. Suggest revising 993-2.4.4 to “reflective sheeting shall have a minimum width of 8 inches and have a minimum of 230 inch² of area facing away from the nose of the separator”

The manufacturer had approached NTPEP before about their system, but NTPEP would not test it because it was far outside the “standard” for flexible delineator posts. The other types of flexible delineators including the proposed high performance type are routinely endurance tested by NTPEP.

Finding a test lab that has a facility to accommodate 55 MPH vehicle impacts to hit the markers while mounted on a concrete island is difficult. I’ve found a test place that would do it, but not on a concrete island, and the price was unbelievable. Same with the base testing. This base has a higher profile than the flex tube bases because it needs to hold a larger top to accommodate 8” wide sheeting.

As for the color requirements, our product is made from a virgin polyethylene based plastic. I’ve asked the manufacturer if this ASTM test is applicable to this type of material or if these tests and values are specific to recycled plastics. I would appreciate the opportunity to provide additional information on this item as it relates to my product.

Since I gather the intent of this device is to be used when a problem with the median nose has been established, I suggest not requiring this scale of impact testing. I can see for flex pots mounted on the pavement who’s purpose is to get hit. The median island delineators are not supposed to be hit – they are supposed to avert the vehicle impact. However, they are flexible so that they will rebound after impact (ours uses a rubber boot that attaches to the bottom part of the post and then is attached to the base plate which is approximately 12” square) I do not envision these types of delineators being in widespread use like the high performance or recycled flexible posts, but will there be pay items added for it? Or will this be a Maintenance item to be used on an as-needed basis?

Response:

The minimum height was determined by measuring your marker. The marker at the test site is 42 inches high.

By the dimensions of the retroreflective sheeting, it is clearly a panel.

The sentence with the area of the retroreflective sheeting was modified based on your suggestion to indicate the area facing the nose.

To assure that all products are tested and approved under the same conditions, just putting the marker out and seeing if it doesn't get hit would not be testing each product under the same conditions. I agree these delineators should not be hit as often as the high performance. We have reduced the number of impacts from 25 hits to 10 hits. The testing should comply with NTPEP which is a flush mounted installation, not on top of a curb.

Section 705-5 gives the basic pay item for object markers and delineators. The Basis of Estimates Manual gives the further breakdown of the pay items by object marker type and delineator type. We are getting away from duplicating the full pay item breakdown in the Specifications and Basis of Estimate Manual. The products would be used in new construction as well as maintenance applications.

Alan Lafferty, Gulf Industries, Inc., gulf7@earthlink.net
Wayne Burger, Gulf Industries, Inc., wayne@gulfindustriesinc.com
Sue Reiss, Impact Recovery Systems, sreiss1276@aol.com

Thank you for the opportunity to comment on the Departments proposed specification change for section 993, 972 and 705. Gulf Industries is a manufactures representative for Impact Recovery Systems in Florida. We feel it is important to provide the most durable and effective delineation systems available to the motoring public traveling the roads of America. Impact Recovery Systems delineators and products have proven to be a cost effective system for high impact areas as well as work zone and pedestrian applications.

Comment:

Section 993-2.4.2 Post Base: The base post shall have a replacement feature which allows for the replacement of the post. The base shall be permanently anchored to the separator and be capable of withstanding one hundred vehicle impacts without damage.

Consider revising to:

The base shall be mechanically anchored to the separator and be capable of withstanding one hundred vehicle impacts without detaching.

Response:

The wording has been modified based on your suggestion.

Comment:

Section 993-2.5.1 Dimensions: The post shall have a minimum height of 48 inches above the pavement surface. The post shall have a minimum diameter or width of 3 inches.

Consider revising to:

The post shall have a minimum height of 48 inches above the pavement surface. The post shall have a minimum diameter or width of 2.5 inches.

Response:

The minimum post diameter was changed to 2.7 inches to allow for your product.

Comment:

Section 993-2.5.2 Post Base: The base shall have a replacement feature which allows for the replacement of the post. The base shall be permanently anchored to the roadway and be capable of withstanding one hundred vehicle impacts without damage.

Consider revising to:

The base shall be mechanically anchored to the separator and be capable of withstanding one hundred vehicle impacts without detaching.

Response:

The wording has been modified based on your suggestion.

Comment:

Section 993-2.5.4 Retroreflective Sheeting: the reflective sheeting shall be Type IV abrasion resistant sheeting and meet the requirements of Section 994. The reflective sheeting shall have a minimum width of 3 inches and have a minimum area of 30 inch².

The Impact Recovery Systems post is 2.73 inches in diameter. Consider revising to: The reflective sheeting shall be Type IV abrasion resistant sheeting and meet the requirements of Section 994. The reflective sheeting shall have a minimum omni directional surface area of 30 inch².

Response:

The wording has been modified based on your suggestion.

Comment:

Section 705-2.2 Product Acceptance on the Project. Ensure that delineators, and delineator post assemblies and markers used to delineate guardrail are listed on the Qualified Products List.

This section refers to guardrail only, consider revising to: Ensure that delineators object markers and reflector units for guardrail and barrier wall are listed on the Qualified Products List.

Response:

Section 705-2.2 does not refer only to guardrail markers. It refers to delineators, delineator post assemblies, and markers for guardrail & barrier wall. The only thing it does not include is object markers. Object markers are covered by MUTCD.

Comment:

Section 705-5 Basis of Payment.

“Section 705- 11 Delineator – each” lumps recycled flexible post delineators, nonflexible post delineators, high visibility median separator delineators and high performance delineators together.

There are significant manufacturing and performance differences between each of this category’s of products which will affect the cost. A recycled flexible delineator post requires 5 vehicle impact hits at 55 mph and a high performance delineator post requires 100 vehicle impacts at 55 mph. A high visibility median separator delineator requires 230 inch² of reflective sheeting which dramatically increases the cost of this system over the two other categories.

Consider revising to:

705- 11 Delineator – each.

705- 12 High Visibility Median Separator Delineator – each.

705- 13 High Performance Delineator – each.

Response:

Section 705-5 gives the basic pay item for object markers and delineators. The Basis of Estimates Manual gives the further breakdown of the pay items by object marker type and delineator type. We are getting away from duplicating the full pay item breakdown in the Specifications and Basis of Estimate Manual.
