In Reply Refer To: HOP-AS 833

HAL9000 Series P Tape

Mr. H.I. Way
Assistant State Engineer (061R)
Any State Department of Transportation
205 South 17th Avenue
Capitol City, Any State 00000-0000

Dear Mr. Way:

We have reviewed the Any State Department of Transportation (ASDOT) request and clarification letters regarding the finding in the public interest request for HAL9000 Series P Tape dated February 27, 2008 and August 29, 2008. The engineering and economic analyses and the detailed discussion of the specific applications of the tape provide a detailed basis and better understanding of the rationale being used by ASDOT and meets the core requirements set forth in 23 CFR 635.411.

The HAL9000 Series P Tape is approved for use on Federal-aid projects for a five-year period effective from the date of this letter. As identified in your request this tape may be used on the longer lasting concrete or rubberized asphalt surfaces (due to the minimal maintenance treatments that may impact the striping) for the following items:

- Freeway-to-freeway interchange striping,
- Freeway skip line striping,
- HOV lane symbols, and
- Freeway gore striping.

The analysis provided in your request clearly show a benefit of this product based on life cycle cost. As such, the use of this product on new or reconstruction projects is appropriate and should maximize its life cycle benefits. Any projects that are temporary or short term in duration should be evaluated on their own merits for the use of this tape.

Additionally, we are making this public interest finding with the stipulation that ASDOT continue to monitor the tape applications to ensure that Any State has received the full economic advantage provided by this product. This monitoring may include, but is not
limited to, the tracking of quality issues, restriping due to changes in traffic patterns, and pavement flushing.

For future usage beyond the five years or expansion of the use of HAL9000 Series P Tape, ASDOT will need to request approval in accordance with the core requirements set forth in 23 CFR 635.411.

We understand and are pleased to know that ASDOT is committed to continuous monitoring and evaluation of the market for high durability permanent striping tape. We would appreciate receiving copies of these evaluations to stay informed on your experiences and to facilitate any future discussions in this area.

If you have any further questions or concerns Jane Doe, our Safety Programs Manager, will be happy to discuss them with you. Please feel free to call her at (888) 555-1212.

Sincerely,

Zebediah Smith
Division Administrator

cc: J Doe, FFederal, JJ Jones
add those options to our specification if and when and they prove to be as durable as the HAL9000 material.

We are proposing to continue the use of this product on freeway to freeway interchanges, for lane line skip stripes, for gore area striping, and for HOV lane symbols on projects that have either a concrete or rubberized asphalt surface. All other pavement markings lines (main line edge lines, HOV lane lines, on/off ramp edge lines, ramp lane lines, and arrows.) will continue to be either hot applied thermoplastic, epoxy, or paint.

The original installation of the HAL9000 Series P tape has lasted for over nine years in both the tunnel and on the I-10 Westbound to I-47 Southbound Ramp. During the last five years we have used it on all of the rubberized asphalt projects, and the tape continues to be brighter at night than brand new thermoplastic. It has proven to be very durable in our current applications. Our testing indicates that this material continues to be more retroreflective than any other tape product on the market. This product has a six year published warranty, compared to a one year published warranty for any other competitive tape.

With our maintenance budgets' being limited more and more, the use this product has reduced the striping maintenance in the above described applications. This should result in an overall cost savings to the public. It has reduced the exposure to our maintenance forces and minimized the inconvenience to the motoring public when we have to close ramps and/or lanes to maintain the striping. With the enhanced visibility and durability, we believe this product results in safer, more visible roadway markings for the motorist.

The HAL9000 Series P Tape is more expensive than 90 mil thermoplastic pavement marking material. However, the HAL9000 Series P Tape does provide unique features and performance characteristics that should help mitigate the frequent maintenance of existing striping in areas with high traffic volumes. Market research indicates that HAL9000 has no competition in this product category.

Quantitative analysis and field use shows that HAL9000 Series P Tape has special visibility enhancing features that should enable drivers opportunities to see better at night. These features include high durability with the only published six year warranty, and the high retroreflectivity levels with initial installation and throughout the life of the product. All of these features should decrease the need for maintenance and decreases the exposure to the maintenance workers and the traveling public to maintenance activities and road closures.

Once again I want to ensure you that ASDOT is committed to the testing of any new high durability highly retroreflective tape product when made available and with favorable results they will be added to the approved list for use.

Pursuant to your approval, we will continue to include this product in future projects. If you have any questions, comments or concerns please do not hesitate to contact me.

Sincerely,
Test Results of High Durability Highly Retro-reflective Tape Products

Since July of 2004 the Any State Department of Transportation (ASDOT) has used the area of Interstate 10 between 7th Avenue and 7th Street as a test deck for different high durability high retro-reflective products. This area of I-10 was selected for the test area because of high traffic volumes, weaving movements and the frequent closures for maintenance activities, which allows for retro-reflective data collection.

The products tested include Company X; XXX-400, Company Y; YYY-900, Company Z; ZZZ-43 and two different HAL9000 products – Series P and Series P1. The Delta LTL-X Retro Meter was used to randomly test each product for retro-reflective during each planned maintenance road closure. The results are outlined in the table below:

<table>
<thead>
<tr>
<th>Product</th>
<th>XXX-400</th>
<th>YYY 90</th>
<th>ZZZ 43</th>
<th>HAL9000 P</th>
<th>HAL9000 P1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>High</td>
<td>Median</td>
<td>Low</td>
<td>High</td>
<td>Median</td>
</tr>
<tr>
<td>Jul-04</td>
<td>724</td>
<td>590</td>
<td>501</td>
<td>886</td>
<td>706</td>
</tr>
<tr>
<td>Nov-04</td>
<td>853</td>
<td>539</td>
<td>331</td>
<td>321</td>
<td>264</td>
</tr>
<tr>
<td>Mar-05</td>
<td>409</td>
<td>332</td>
<td>201</td>
<td>228</td>
<td>195</td>
</tr>
<tr>
<td>Jun-05</td>
<td>329</td>
<td>223</td>
<td>82</td>
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<td>96</td>
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<tr>
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<td>83</td>
<td>43</td>
<td>104</td>
<td>79</td>
</tr>
</tbody>
</table>

The results of the retro-reflective readings indicate that the average millicandels readings for most of the products fell below the 100 millicandel level after only approximately 27 months of use and have been replaced.