Memorandum

To: DISTRICT DIRECTORS

Date: June 1, 2012

From: STEVE TAKIGAWA
Deputy Director
Maintenance and Operations

ROBERT PIEPLOW
Acting Deputy Director
Project Delivery

Subject: Implementation of Pavement Safety Edge

To allow drivers who drift off the highway to return to the road safely and smoothly and to help reduce pavement edge-related crashes, the California Department of Transportation (Caltrans) is implementing use of the pavement safety edge. The safety edge is a sloped edge of 30 degrees placed at the edge of roadway pavement. The safety edge is a Federal Highway Administration Every Day Counts Initiative and is included as an action item in the “Implementation of the California Strategic Highway Safety Plan.”

The effective date for the implementation of this change is October 1, 2012. This change does not apply to projects where a PS&E has already been submitted to DES OE or the project is under construction prior to October 1, 2012. The safety edge should be incorporated on all projects that include pavement items unless a specific condition can be documented that would preclude the benefit of adding the feature (see attached Safety Edge FAQ). Specifically, the safety edge will not be incorporated in the following locations:

- Next to curbs, dikes, guardrails, barriers, walls, and landscape paving.
- Where the distance from the edge of the pavement shoulder to the hinge point is less than 1 foot and there is not enough room for the safety edge.
- Within 3 feet of driveways or intersections.
- On pavement overlays that are less than 0.15 feet thick.

Continue to place embankment or shoulder backing to the edge of the pavement shoulder as shown in the attached revised Standard Plans for pavement edge treatments (RSP P74, RSP P75, and RSP P76). Also attached for your use to implement the safety edge are Standard Special Provisions for asphalt and concrete, along with examples of typical cross sections and quantities.

More information from the FHWA about the pavement safety edge can be found on the Internet at <http://www.fhwa.dot.gov/everydaycounts/technology/safetyedge/intro.cfm>. If you have questions or comments regarding documentation and use of the pavement safety edge, please contact Janice Benton (916-654-5176), Bill Farnbach (916-227-5845), or Chuck Suszko (916-227-7314).

Attachments
c: Terry Abbott, Chief, Division of Design
   Robert Copp, Chief, Division of Traffic Operations
   Mark Leja, Chief, Division of Construction
   Tony Tavares, Chief, Division of Maintenance
   Janice Benton, Chief, Office of Traffic Safety Program, Division of Traffic Operations
   Bill Fambach, Chief, Office of Concrete Pavement and Pavement Foundations,
   Division of Maintenance--Pavement Program
   Chuck Suszko, Chief, Office of Construction Engineering, Division of Construction
**Background**

According to figures prepared by the US DOT, run off road crashes account for 58% of highway fatalities. Research that has examined the role that pavement edges play in run off road collisions has documented that crashes caused by pavement drop-offs resulted in fatalities more often than other types of crashes. The chain of events that results in a simple roadway departure becoming a fatal collision begins with a vehicle that has departed the travelled portion of the roadway due to driver inattention, drowsiness or incapacitation. The driver recovers upon beginning the departure from the paved surface and when they attempt to return to the roadway they have difficulty mounting the vertical edge of pavement which over time has become exposed due to the wearing away of the shoulder backing material adjacent to the pavement. Field tests have determined that without a reduction in speed by the driver, the return of the vehicle to the roadway can be exacerbated by over steering to the left with possible loss of control. The vehicle may veer into the adjacent lane, where it could collide with, or sideswipe oncoming cars, overturn or run off the opposite side of the road and crash.

One low cost solution to this edge drop condition that has proven effective through field testing has been the application of a beveled 30-35 degree asphalt wedge or “Safety Edge” that has been applied at the right roadway edge as a part of new paving or resurfacing projects. Caltrans has applied similar treatments in the past using the “Notch Wedge” treatment to apply a beveled edge that could be more easily traversed between areas where there is a new pavement surface within a lane to an adjacent unpaved lane or correspondingly from an unpaved lane onto an adjacent paved surface. It should be noted that the Safety Edge is simply a pavement edge treatment; the application should be applied based upon a rational evaluation of safety history and the benefits that might be attained through application of various treatments relative to their costs. The application of safety edge within a roadway section would not change the safety performance of a well maintained roadway with shoulder backing in place where safety edge has not been installed.

**Frequently Asked Questions**

For a project with limited right of way is there a hierarchy for determining which is more important; adding shoulder width including rumble strips or safety edge?

From a cost effectiveness standpoint only, the hierarchy would be as follows: rumble strips would have the highest value as they alert a driver who is departing their lane and in many instances prevent a lane departure; a safety edge will provide a second line of defense and allow a vehicle to return to the travelled way with greater ease; a shoulder widening, which could require the purchase of additional right of way, would also provide incremental improvements in safety for each foot of additional shoulder width. Since shoulder widths already have standards that need to be evaluated (Design Exceptions in the Highway Design Manual), both rumble strips and safety edge should be considered on all appropriate projects. Each of these features has an expected safety benefit that would allow for their evaluation individually or in combination using Highway Safety Manual to determine the net improvement in safety.
Is there a greater benefit for the safety edge on rural two lane highways?

*Rural two lane highways which have a disproportionate share of runoff road collisions would benefit from the implementation of the safety edge.*

Why will a safety edge not be included on pavement projects that add less than 0.15’ of pavement?

*According to information provided by the Caltrans Pavement Program, safety edge installations accompanying AC lifts of less than 2” (0.15’) have not performed well from a structural standpoint.*

Will the implementation of the safety edge drive environmental considerations (e.g. footprint of impervious area, potential disturbed soil area impacts)?

*The environmental concerns and the costs of mitigating them along with any costs related to addressing run off road collisions at a treatment location where run off road collisions may be a concern should be evaluated and compared with the net expected safety benefits that can be attained from the use of safety edge and other related treatments (shoulder widening, rumble strips etc). The environmental concerns and expected safety benefits will vary by location, roadway type and traffic volumes so these questions should be evaluated on a case by case basis as a part of the safety review.*

Does the term “safety” edge imply that in those cases where it is not used the pavement edge is not safe?

*Safety edge should be considered a pavement edge treatment only, it in itself is not going to make a road safer or less safe, it may in combination with the circumstances surrounding a particular run off road collision provide the ease of return to the roadway that makes one less collision occur. The driver’s behavior and the vehicles performance also weigh heavily on this outcome. It should be installed based upon engineering judgment, but sections without it should by no means be considered less safe.*
NOTES:
1. For details not shown, see Revised Standard Plans RSP P75 and RSP P74.
2. Safety edge is optional when L is less than 30°.
### Table A: Edge Treatment for Various Overlay Thickness and Conditions

<table>
<thead>
<tr>
<th>TYPICAL CROSS SECTION</th>
<th>TOTAL ADDED MATERIAL FOR SE/SE/MILE</th>
<th>TYPICAL CROSS SECTION</th>
<th>TOTAL ADDED MATERIAL FOR SE/SE/MILE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HMA (Tons)</td>
<td>CONCRETE (Ct/m³)</td>
<td>CONCRETE (Ct/m³)</td>
</tr>
<tr>
<td>0.15'</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>0.20'</td>
<td>13.7</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>0.30'</td>
<td>30.9</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>0.40'</td>
<td>44.9</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>0.45'</td>
<td>69.4</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>0.50'</td>
<td>84.2</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>0.60'</td>
<td>113.9</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>0.75'</td>
<td>165.6</td>
<td>70.9</td>
<td>94.2</td>
</tr>
<tr>
<td>0.80'</td>
<td>175.3</td>
<td>86.6</td>
<td>116.2</td>
</tr>
<tr>
<td>0.85'</td>
<td>202.0</td>
<td>100.3</td>
<td>120.5</td>
</tr>
<tr>
<td>1.00'</td>
<td>232.7</td>
<td>114.9</td>
<td>146.2</td>
</tr>
<tr>
<td>1.20'</td>
<td>292.1</td>
<td>144.3</td>
<td>184.2</td>
</tr>
</tbody>
</table>

*W For Detail "C"  
*O For Optional Detail "A"

### Notes:
1. For limits of safety edge and vertical edge treatments, see Revised Standard Plan RSP P76.
2. Details shown for HMA overlay thickness less than 0.45'. See Detail "A" for HMA overlay thickness more than 0.45' or concrete overlay.
3. For locations and limits of shoulder backing or embankment see project plans.
4. Grade existing ground to place safety edge, 1' minimum width.
5. Safety edge transverse joint must match overlay transverse joint.
6. Horizontal and/or longitudinal bar must be 2' x 1/2' clear from transverse joint.
7. Safety edge is not needed on the area of NBI barriers, right turn lane and acceleration lane. See Revised Standard Plan RSP P76.
CASE K
Safety Edge - Fill Section, HM 2 1'

CASE L
Vertical Edge - Fill Section, HM < 1'

CASE M
Safety Edge - Cut Section, HM 2 1'

CASE N
Vertical Edge - Cut Section, HM < 1'

FILL SECTION

DETAIL "B"
For HMA pavement thickness more than 0.43' or concrete pavement

CUT SECTION

NOTES:
1. For limits of safety edge and vertical edge treatments, see Revised Standard Plan RSP P74
2. Details shown for HMA pavement thickness less than 0.43'. See Detail "B" for HMA pavement thickness more than 0.43' or concrete pavement.
3. For locations and limits of embankment see project plans.
4. Safety edge transverse joint must match pavement transverse joint.
5. Safety edge is not needed in the area of WSDR, barrier, right turn lane and acceleration lane. See Revised Standard Plan RSP P74.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
PAVEMENT EDGE TREATMENTS - NEW CONSTRUCTION
NO SCALE

REVISED STANDARD PLAN RSP P76
Section 39-1.30. Use for HMA pavement.

Replace section 39-1.30 with:

39-1.30 EDGE TREATMENT, HOT MIX ASPHALT PAVEMENT

39-1.30A General
Section 39-1.30 includes specifications for constructing the edges of HMA pavement as shown.

39-1.30B Materials
For the safety edge, use the same type of HMA used for the adjacent lane or shoulder.

39-1.30C Construction
The edge of roadway where the safety edge treatment is to be placed must have a solid base, free of debris such as loose material, grass, weeds, or mud. Grade areas to receive the safety edge as required.

The safety edge treatment must be placed monolithic with the adjacent lane or shoulder and shaped and compacted with a device attached to the paver.

The device must be capable of shaping and compacting HMA to the required cross section as shown. Compaction must be by constraining the HMA to reduce the cross sectional area by 10 to 15 percent. The device must produce a uniform surface texture without tearing, shoving, or gouging and must not leave marks such as ridges and indentations. The device must be capable of transition to cross roads, driveways, and obstructions.

For safety edge treatment, the angle of the slope must not deviate by more than ± 5 degrees from the angle shown. Measure the angle from the plane of the adjacent finished pavement surface.

If paving is done in multiple lifts, the safety edge treatment can be placed either with each lift or with the final lift.

Short sections of hand work are allowed to construct transitions for safety edge treatment.

For more information on the safety edge treatment, go to:

http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/

You can find a list of commercially available devices at the above Web site under "Frequently Asked Questions" and "Construction Questions."

39-1.30D Payment
Not Used
USE WITH 2006 STANDARDS.
Use for HMA pavement.

10-1. EDGE TREATMENT, HOT MIX ASPHALT PAVEMENT

GENERAL
This work includes constructing the edges of HMA pavement as shown on the plans.

MATERIALS

2
HMA for safety edge treatment must comply with Section 39, "Hot Mix Asphalt," of the Standard Specifications.

3
For the safety edge, use the same type of HMA used for the adjacent lane or shoulder.

CONSTRUCTION

4
The edge of roadway where the safety edge treatment is to be placed must have a solid base, free of debris such as loose material, grass, weeds, or mud. Grade areas to receive the safety edge as required.

5
The safety edge treatment must be placed monolithic with the adjacent lane or shoulder and shaped and compacted with a device attached to the paver.

6
The device must be capable of shaping and compacting HMA to the required cross section as shown on the plans. Compaction must be by constraining the HMA to reduce the cross sectional area by 10 to 15 percent. The device must produce a uniform surface texture without tearing, shoving, or gouging and must not leave marks such as ridges and indentations. The device must be capable of transition to cross roads, driveways, and obstructions.

7
For safety edge treatment, the angle of the slope must not deviate by more than \( \pm 5 \) degrees from the angle shown on the plans. Measure the angle from the plane of the adjacent finished pavement surface.

8
If paving is done in multiple lifts, the safety edge treatment can be placed either with each lift or with the final lift.
Short sections of hand work are allowed to construct transitions for safety edge treatment.

For more information on the safety edge treatment, go to:

http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/

You can find a list of commercially available devices at the above Web site under "Frequently Asked Questions" and "Construction Questions."

**MEASUREMENT AND PAYMENT**

Full compensation for constructing edge treatments, including grading when required for preparation of the area to receive the safety edge treatment, are included in the contract price paid per ton for the type of HMA designated in the verified Bid Item List and no additional compensation will be allowed.
Section 40-1. Use for concrete pavement shoulders.

Replace "Reserved" in section 40-1.03L(1):

Construct edge treatments as shown. This work includes grading when required for the preparation of safety edge areas.

Sections 40-1.03L(2) and 40-1.03L(3) do not apply to safety edges.

For safety edges placed after the concrete pavement is complete, concrete may comply with the requirements for minor concrete.

For safety edges placed after the concrete pavement is complete, install connecting bar reinforcement under section 52.

Saw cutting or grinding may be used to construct safety edges.

For safety edges, the angle of the slope must not deviate by more than ± 5 degrees from the angle shown. Measure the angle from the plane of the adjacent finished pavement surface.
USE WITH 2006 STANDARDS.
Use for concrete pavement shoulders.

10-1. EDGE TREATMENT, CONCRETE PAVEMENT

GENERAL
This work includes constructing the edges of concrete pavement.

2
Edge treatments must comply with Section 40, "Concrete Pavement," of the Standard Specifications except Sections 40-3.11, "Preliminary Finishing" and 40-3.12, "Final Finishing" do not apply to safety edges.

MATERIALS

3
For safety edges placed after the concrete pavement is complete, concrete may be minor concrete under Section 90-10, "Minor Concrete," of the Standard Specifications and these special provisions. If connecting bar reinforcement is installed by the drill and bond method, comply with the requirements in Section 40-2.05, "Chemical Adhesive (Drill and Bond)," of the Standard Specifications and these special provisions.

CONSTRUCTION

4
You may construct safety edges after the concrete pavement has been constructed. Install connecting bar reinforcement under Section 52, "Reinforcement," of the Standard Specifications.

5
Saw cutting or grinding may be used to construct safety edges.

6
For safety edges, the angle of the slope must not deviate by more than ± 5 degrees from the angle shown on the plans. Measure the angle from the plane of the adjacent finished pavement surface.

MEASUREMENT AND PAYMENT

7
Full compensation for edge treatment of concrete pavement, including grading when required for preparation of the area to receive safety edges, is included in the contract paid per cubic yard for concrete pavement of the type involved and no additional compensation is allowed.
### PAVEMENT STRUCTURE

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>HMA (TYPE A)</th>
<th>CLASS II AGGREGATE BASE</th>
<th>IMPORTED BORROW</th>
<th>ROADWAY EXCAVATION</th>
<th>SHOULDER BACKING</th>
<th>IMPORTED TOPSOIL</th>
<th>COLD PLANE AC PAVEMENT</th>
<th>TACK COAT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TON</td>
<td>CY</td>
<td>CY</td>
<td>CY</td>
<td>TON</td>
<td>CY</td>
<td>SOYD</td>
<td></td>
</tr>
<tr>
<td>S10 102+50 to 105+50</td>
<td>117</td>
<td>119</td>
<td>29</td>
<td>137</td>
<td>18</td>
<td>907</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>S10 105+50 to 113+29</td>
<td>1749</td>
<td>2184</td>
<td>5956</td>
<td>2600</td>
<td>24</td>
<td>567</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>S10 113+29 to 114+112</td>
<td>362</td>
<td>2039</td>
<td>361</td>
<td>2315</td>
<td>752</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S10 114+12 TO 115+00</td>
<td>1307</td>
<td>1130</td>
<td>361</td>
<td>2315</td>
<td>752</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S10 115+00 TO 123+50</td>
<td>746</td>
<td>1369</td>
<td>482</td>
<td>1066</td>
<td>18</td>
<td>311</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>S10 123+50 TO 124+50</td>
<td>42</td>
<td>85</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;DYN&quot; S10 10+00 TO 11+28</td>
<td>37</td>
<td>85</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAFETY EDGE</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HMA DIKE</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>4105</td>
<td>4802</td>
<td>1315</td>
<td>8165</td>
<td>70</td>
<td>1319</td>
<td>1218</td>
<td>3.3</td>
</tr>
</tbody>
</table>

### PLACE HMA DIKE

<table>
<thead>
<tr>
<th>SHEET</th>
<th>STATION</th>
<th>LT</th>
<th>RT</th>
<th>LF</th>
<th>LF</th>
<th>LF</th>
<th>TON</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L-1</td>
<td>104+00 TO 109+00</td>
<td>X</td>
<td>450</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>110+00 TO 115+00</td>
<td>X</td>
<td>250</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>112+45 TO 113+10</td>
<td>X</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>114+27 TO 114+52</td>
<td>X</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>114+35 TO 114+60</td>
<td>X</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>115+12 TO 115+37</td>
<td>X</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>116+37 TO 121+00</td>
<td>X</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-1</td>
<td>&quot;DYN&quot; 10+00 TO 10+50</td>
<td>X</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>530</td>
<td>1346</td>
<td>75</td>
<td>90</td>
<td></td>
</tr>
</tbody>
</table>

* = QUANTITY INCLUDED IN PAVEMENT STRUCTURE TABLE

### METAL BEAM GUARD RAILING AND END TREATMENTS

<table>
<thead>
<tr>
<th>SHEET</th>
<th>STATION</th>
<th>LT</th>
<th>RT</th>
<th>EA</th>
<th>LF</th>
<th>EA</th>
<th>EA</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-2</td>
<td>112+63 TO 113+10</td>
<td>X</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>112+65 TO 113+20</td>
<td>X</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>112+67 TO 113+30</td>
<td>X</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>112+69 TO 113+40</td>
<td>X</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>113+00 TO 113+50</td>
<td>X</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>3</td>
<td>455</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### SAFETY EDGE

<table>
<thead>
<tr>
<th>SHEET</th>
<th>STATION</th>
<th>LT</th>
<th>RT</th>
<th>SAFETY EDGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-1</td>
<td>102+50 TO 104+50</td>
<td>X</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>L-1</td>
<td>102+50 TO 112+00</td>
<td>X</td>
<td>950</td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>112+00 TO 112+50</td>
<td>X</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>112+00 TO 124+50</td>
<td>X</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>221+00 TO 224+00</td>
<td>X</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>1900</td>
<td></td>
</tr>
</tbody>
</table>

### SAFETY EDGE

<table>
<thead>
<tr>
<th>SHEET</th>
<th>STATION</th>
<th>LT</th>
<th>RT</th>
<th>SAFETY EDGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-1</td>
<td>102+50 TO 112+00</td>
<td>X</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>L-2</td>
<td>112+00 TO 124+50</td>
<td>X</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>1900</td>
<td></td>
</tr>
</tbody>
</table>

### SUMMARY OF QUANTITIES

Q-1

<table>
<thead>
<tr>
<th>SHEET</th>
<th>STATION</th>
<th>LF</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-1</td>
<td>112+50 TO 112+00</td>
<td>1150</td>
</tr>
<tr>
<td>L-2</td>
<td>112+50 TO 124+50</td>
<td>750</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>1900</td>
</tr>
</tbody>
</table>

*NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY*

...-Safety Edge Quantity Sample.dgn 1/24/2014 4:06:53 PM
| STATION | LOCATION | COLD BASE ASPHALT CONCRETE EXCAVATION | ROADWAY | ROUGH ELEVATION | ROUGH ELEVATION | ASPHALT TREATED RECLAIMED BASE | ASPHALT TREATED RECLAIMED BASE | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | ROADWAY | RO