Asphalt Treated Permeable Base, I-89
Georgia, Vermont

Report 2005-1
September 2005

State of Vermont
Agency of Transportation
Materials and Research Section

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This report discusses the construction and 6 year performance of an experimental asphalt treated permeable base on an interstate highway in Georgia, VT, as compared with a section that had its base material recrushed and recompacted in place.

Evaluative criteria included cracking, roughness and field observations. After six years of performance both sections exhibited somewhat low roughness values, although there appears to be a greater degree of roughness in the ATPB area. There is also more longitudinal cracking evident in the experimental area with no transverse cracking evident in any of the sections over the length of the test.
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“The information contained in this report was compiled for the use of the Vermont Agency of Transportation. Conclusions and recommendations contained herein are based upon the research data obtained and the expertise of the researchers, and are not necessarily to be construed as Agency policy. This report does not constitute a standard, specification, or regulation. The Vermont Agency of Transportation assumes no liability for its contents or the use thereof.”
Introduction:

In the early 1990’s the Vermont Agency of Transportation determined that a section of Interstate 89 was in need of rehabilitation. To facilitate this process, a project was developed that was designed with full depth rehabilitation of the bituminous pavement between MM 106.90 and 111.00 in both the northbound and southbound barrels of the highway. This section had been in service for 30 years, having been constructed initially in 1968, with a 1” maintenance treatment of bituminous concrete installed in 1982. Since that time, the pavement had developed thermal related fatigue, which was evident by regularly spaced transverse cracking. The situation has also been aggravated by retention of moisture in the aggregate layer below the pavement. As a result the highway experienced distress due to frost action that negatively affected ride. The combination of poor ride and accelerated rate of deterioration were instrumental in determining a need rehabilitation on this section of highway.

During the design stage of this particular rehabilitation project, designated as Georgia-Fairfax IM 089-3(26), the Vermont Agency of Transportation (VTrans) determined that this would be an opportune time to examine the performance of asphalt treated permeable base (ATPB) as a solution to the pavement distress, such as was experienced in this section of highway. Encouraged by reports of New York State DOT’s success with this treatment, VTrans elected to use New York’s material specifications and incorporate a 0.80-km (½ mile) test section of the material into a particularly troublesome area of the project, from MM 109.00 to 109.50 in the northbound lane (Appendix A, pages 10-13).

Material Description

The ATPB layer placed on this project was designed in accordance with New York State DOT specification (see Appendix B, page 14). The planned pavement structure consisted of the following courses of materials (in ascending order):

- 6” Sand
- 24” Dense Graded Crushed Stone
- 4” Asphalt Treated Permeable Base
- 6” Bituminous Pavement (Type I S) (binder course)
- 3.5” Bituminous Pavement (Type III S over Type II S) (surface courses)

Drainage was designed into the project by placement of a 200-mm diameter perforated PVC underdrain located under the edge of each shoulder. (See Appendix A, pages 11-13). Theoretically, the stable voids of the permeable base course creates a porous layer where moisture can freely flow to the edge drains. Should this treatment prove successful it could become a useful addition to the state’s pavement treatment inventory.

The rest of the northbound lane was designed using a reclaimed base method. This entailed remixing and compacting eight inches of the existing bituminous concrete and base course in both the travel and passing lanes. Two 3 inch layers of Type IS bituminous binder course were placed on top of the lifts. This was followed by a 2 inch layer of Type IIS and a 1½ inch wearing course of Type IIIS bituminous concrete. This design as well as the shoulder design is shown in the typical sections in the project plans in Appendix A (pages 11 to 13). The asphalt binder used was PG 64-28.
Project Description

This project, Georgia- Fairfax IM 089-3(26), was constructed during the summer of 1998. It initially consisted of a full depth removal and reclamation of the existing bituminous pavement to the subbase, in order to improve the drainage patterns and the frost and moisture related distresses inherent to this section highway. The project extended from MM 106.90 to MM 111.00 in both the northbound and southbound lanes, with the experimental ATPB section being installed across both lanes and most of the shoulder (see typical in Appendix A) between MM 109.00 to MM 109.50 in the northbound lane only.

Initial Pavement Condition

The performance of the ATPB treatment has been evaluated by observing the pavement condition over time, identifying any developing crack patterns using procedures detailed in the Distress Identification Manual for the Long-Term Pavement Performance Project (SHRP-P-338). Prior to construction, three test sites were established in the ATPB treatment area, as well as three control sites outside of the test section for comparison. The control sites were reconstructed with a standard unbound base material. The test sites are 100 feet in length and within each test site the rate of cracking, expressed in feet of cracking per 100 feet, are measured. However, because of safety concerns, rutting data was not collected as part of this evaluation. In addition, International Roughness Index (IRI) values, expressed in inches per mile of roughness have also been collected to document pavement roughness. These data are being used to evaluate the performance of ATPB test section. Further evaluations may include rutting readings to better describe the pavement’s condition.

Before removal of the existing pavement, a crack survey was performed in the test sites, with the following results:

<table>
<thead>
<tr>
<th>1997 Pre Construction Cracking Data (feet/100feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997 Cracking</td>
</tr>
<tr>
<td>Centerline</td>
</tr>
<tr>
<td>Longitudinal</td>
</tr>
<tr>
<td>Tranverse</td>
</tr>
<tr>
<td>Miscellaneous</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Table 1 - Pre Construction Cracking

As shown in Table 1, the study area of the project had considerable cracking, with longitudinal cracking being predominate. However the most severe cracks noted were those that were transverse and occurring in roughly three meter intervals. Rutting also appeared to be severe through much of the roadway, however it was not measured. International Roughness Index (IRI) values appear in Table 2: (For comparison, locations one-half mile north and south of the experimental section were used).
### Table 2 - Preconstruction IRI Readings, I-89, Georgia-Fairfax - 1997

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>IRI Left Lane</th>
<th>IRI Right Lane</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control South</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>108.5</td>
<td>108.6</td>
<td>143</td>
<td>182</td>
<td>162</td>
</tr>
<tr>
<td>108.6</td>
<td>108.7</td>
<td>134</td>
<td>164</td>
<td>149</td>
</tr>
<tr>
<td>108.7</td>
<td>108.8</td>
<td>112</td>
<td>127</td>
<td>120</td>
</tr>
<tr>
<td>108.8</td>
<td>108.9</td>
<td>119</td>
<td>178</td>
<td>148</td>
</tr>
<tr>
<td>108.9</td>
<td>109</td>
<td>152</td>
<td>179</td>
<td>165</td>
</tr>
<tr>
<td>Experimental Area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>109</td>
<td>109.1</td>
<td>192</td>
<td>212</td>
<td>202</td>
</tr>
<tr>
<td>109.1</td>
<td>109.2</td>
<td>133</td>
<td>190</td>
<td>162</td>
</tr>
<tr>
<td>109.2</td>
<td>109.3</td>
<td>129</td>
<td>197</td>
<td>163</td>
</tr>
<tr>
<td>109.3</td>
<td>109.4</td>
<td>119</td>
<td>156</td>
<td>137</td>
</tr>
<tr>
<td>109.4</td>
<td>109.5</td>
<td>134</td>
<td>179</td>
<td>156</td>
</tr>
<tr>
<td>Control North</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>109.5</td>
<td>109.6</td>
<td>185</td>
<td>231</td>
<td>208</td>
</tr>
<tr>
<td>109.6</td>
<td>109.7</td>
<td>164</td>
<td>173</td>
<td>169</td>
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<td>109.7</td>
<td>109.8</td>
<td>151</td>
<td>152</td>
<td>151</td>
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<td>109.8</td>
<td>109.9</td>
<td>158</td>
<td>179</td>
<td>169</td>
</tr>
<tr>
<td>109.9</td>
<td>110</td>
<td>166</td>
<td>182</td>
<td>174</td>
</tr>
</tbody>
</table>

#### Cost Data

In 1998, the ATPB treatment was placed at a cost of $30 per ton or $6.67 per square yard. The bid price appears to be in line with standard bituminous concrete ($33/ton) materials installed on interstate highway projects during this construction year.

#### Construction

The project commenced with a full removal by milling of the existing pavement in the summer of 1998. As discussed earlier, the project design called for using reclaimed stabilized base (RSB), however it was discovered that the substructure contained a significant percentage of cobbles in a fine aggregate matrix. As these were too large to be incorporated into the reclaimed stabilized base, it was decided that instead of proceeding as designed that it would be better to increase the amount of subbase material and not use reclaimed stabilized base.

Throughout the project in the place of the RSB, six inches of the 18 inches subbase material was removed and recrushed offsite. It was then replaced on the top of the original subbase material. An additional six inches of new material was placed on top of this lift and compacted (Figure 1). In the experimental area the four inch ATPB layer was placed next, after which two 3” lifts of Type IS bituminous concrete were applied. A 2” binder course of Type IIS was placed next, with the final layer being a 1.5 inch wearing course of Type IIIS bituminous concrete. The project was completed by the end of the 1998 season.

![Figure 1 - Application of ATPB](image)
Laboratory Testing

Bituminous Concrete samples were obtained as acceptance samples and transported back to the VTrans’ Materials Laboratory for analysis. These included the ATPB sections as well as the standard bituminous concrete. All samples met contract specifications in gradation and asphalt content. PG 64-28 asphalt cement was also sampled and analyzed at the laboratory. These materials also met contract specifications.

Field Observations - Cracking

The project site was visited in October 2002. The results of these observations are listed in Table 3 (the centerline paving joint is not included in the totals):

<table>
<thead>
<tr>
<th>2002 Cracking Data (feet/100feet)</th>
<th>Control</th>
<th>Control</th>
<th>ATPB</th>
<th>ATPB</th>
<th>ATPB</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM 108.5</td>
<td>MM 108.7</td>
<td>MM 109.1</td>
<td>MM 109.25</td>
<td>MM 109.4</td>
<td>MM 109.7</td>
<td></td>
</tr>
<tr>
<td><strong>Centerline (Paving Joint)</strong></td>
<td>28</td>
<td>59</td>
<td>21</td>
<td>9</td>
<td>100</td>
<td>48</td>
</tr>
<tr>
<td><strong>Longitudinal</strong></td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>143</td>
<td>80</td>
<td>72</td>
</tr>
<tr>
<td><strong>Transverse</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Miscellaneous</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total (Distress Related Cracking)</strong></td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>143</td>
<td>83</td>
<td>72</td>
</tr>
</tbody>
</table>

Table 3 - 2002 Cracking Data

Very little cracking was evident in the first two control test sites, with only centerline/paving joint cracking noted. Cracks were not significantly evident in the shoulders as well. Limited longitudinal cracking appeared in the third test site (MM109.10, the first in the experimental area); with more significant longitudinal cracking in the second and third ATPB sites as well as the final control site. This can be identified as an 88-foot long crack located 1 to 1.5 feet from the centerline paving joint in test site 109.25. Few other types of cracks were noted within the test area. All of these cracks had also been sealed as part of the statewide crack seal project, and appear to be related to the center and right edge paving joints (See Figures 2 and 3).

The project was reinspected after two additional years of service both in October 2004. These results of these inspections are listed in Table 4:
The pattern exhibited in 2002 continues to become more apparent when these results are reviewed. A large majority of this cracking noted in this inspection is incidental to the paving joints at both the centerline and the right edge of the pavement. In each of the sections cracks incidental to the right edge line and the center line paving joints were evident through the entire 100 feet sections. When these results are removed from the data table the results indicates a trend of increased cracking in the ATPB area, although the counts are low.

![Table 4- 2004 Cracking Data](image)

Table 5 – 2004 Cracking data (minus paving joint and centerline cracking)

One of the major problems of this section of interstate highway before reconstruction was the earlier mentioned thermal related transverse cracking and frost related heaves. As of the inspection of October 2004 there is no evidence of any transverse cracking throughout the any of the test sites in this project. This includes both the experimental area and the control location immediately to north and south of the test section. Therefore at this point, it is unclear if the ATPB treatment has had any effect on reducing these types of cracks.

**Roughness**

Roughness was measured using a Dynatest 5051 Mark II Road Surface Profiler. Roughness measurements were taken every tenth of a mile. As discussed earlier the IRI values were very comparable throughout the control and experimental areas prior to construction. The control areas averaged 162 in/mi (average of both sections), ranging from a low of 120 in/mi to a high of 208 in/mi. The experimental area (MM 109.00 to 109.50) was very comparable with an average of 164 in/mi and a range of 137 to 202 in/mi over its half mile length. However the values measured varied greatly over this 1.5 mile section. This is illustrated in the graph in Figure 4.
At the 4 year inspection, the roughness values exhibited a consistent pattern in both the control and experimental areas. This pattern is shown in Figure 4 and Table 6. The IRI values in the control sections averaged 52 in/mi with a low of 41 and a high of 60 in/mi, with the experimental area exhibiting similar values and averaging 50 in/mi with the same sample range of 41 to 60 in/mi.

Figure 4 also shows the six year (2004) data for roughness in the experimental and two control areas. While the graph indicates that, on the average, the 2004 and 2002 readings are comparable, this can be misleading. Table 6 shows that, most all of the recorded roughness values decreased from the 2002 survey. This includes all values recorded in the travel lane and 10 of 15 values recorded in the passing lane.

In order to make additional conclusions, more data both in frequency of sampling and number of datasets, will be needed. When comparing the various roughness values with each other it is difficult, due to the small sample size, to make any inferences about trends.

![Figure 4- IRI comparison data](image)

**Follow Up**

As of 2004, the data indicates a number of trends. Of primary concern is the crack counts results, which infer that increased cracking of the ATPB over the standard control section could be expected as the projects ages. One area of note is at MM 109.10, where pavement distress, though not yet a crack, was evident near the centerline paving joint. This is shown in both Figures 5 and 6. Areas like these were not present in the control areas north and south of the experimental location.
Assessing the roughness on this section of highway is difficult at this time. On interstate highways data is typically obtained in both the travel and passing lanes at 0.10 mile intervals. After carefully examining the IRI data collected for I-89 northbound between MM 108.5 through 110, it is clear that additional data is needed to make an assessment. IRI values are expected in increase in value over time due to typical aging and wear on the pavement surface. In addition, any cracking or rutting is also expected to increase over time which will affect IRI values.

While the half mile segment of ATPB and the control areas were somewhat comparable both prior to construction and four years after the project was completed, the data collected shows an unanticipated downward trend as the majority of the IRI values decreased between 2002 and 2004 (see Table 6). The only increases occurred in the left, or passing, lane. All IRI decreased on the travel lane for both the control and experimental sections. Due to the unexpected downward trend it is recommended that additional IRI values be collected. Therefore, in an effort to better describe this trend, the frequency of the readings will be increased to gather at least 50 values each in the experimental and two control sections.

The ATPB section of I-89 will continue to be examined on a biennial basis to track the performance of this experimental material. Additional test locations in adjacent projects may also be included in the study. The focus of this investigation will be to determine if the ATPB treatment will prolong the service life to the bituminous pavement. Data collection of crack counts will be gathered in the 2005 constructions season. Increased frequency of IRI measurements will be undertaken to better describe roughness. Rutting measurements may also be taken to better describe the performance of the experimental and control treatments. Particular attention will be placed on the performance of the entire ATPB and control areas and their relationship to the test sites.
### Table 6 - Rollup of IRI Values (All Values in in/mi)

<table>
<thead>
<tr>
<th>Collection Year:</th>
<th>1997 (Preconstruction)</th>
<th>2002</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>From MM</td>
<td>To MM</td>
<td>Left Lane</td>
<td>Right Lane</td>
</tr>
<tr>
<td><strong>Control Section</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>108.50</td>
<td>108.60</td>
<td>143.19</td>
<td>181.84</td>
</tr>
<tr>
<td>108.60</td>
<td>108.70</td>
<td>133.69</td>
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<td>108.70</td>
<td>108.80</td>
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<td>108.90</td>
<td>109.00</td>
<td>152.06</td>
<td>179.31</td>
</tr>
<tr>
<td>Ave</td>
<td></td>
<td>132.04</td>
<td>166.00</td>
</tr>
<tr>
<td>StDev</td>
<td></td>
<td>18.02</td>
<td>9.14</td>
</tr>
<tr>
<td><strong>Experimental Section</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>109.00</td>
<td>109.10</td>
<td>191.98</td>
<td>212.26</td>
</tr>
<tr>
<td>109.10</td>
<td>109.20</td>
<td>133.06</td>
<td>190.08</td>
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<td>109.20</td>
<td>109.30</td>
<td>129.25</td>
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<td>133.69</td>
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<td>Ave</td>
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<td>186.91</td>
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<tr>
<td>StDev</td>
<td></td>
<td>23.55</td>
<td>6.27</td>
</tr>
<tr>
<td><strong>Control Section</strong></td>
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<td></td>
</tr>
<tr>
<td>109.50</td>
<td>109.60</td>
<td>185.01</td>
<td>231.26</td>
</tr>
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<td>109.60</td>
<td>109.70</td>
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<td>172.97</td>
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<td>183.49</td>
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<tr>
<td>StDev</td>
<td></td>
<td>20.69</td>
<td>9.98</td>
</tr>
</tbody>
</table>

**Notes:**

**Bold** - Denote IRI values that decrease from previous collection yr.
STATE OF VERMONT
AGENCY OF TRANSPORTATION

PROPOSED IMPROVEMENT
TOWNS OF GEORGIA AND FAIRFAX
COUNTY OF FRANKLIN
INTERSTATE ROUTE 89

BEGINNING IN THE TOWN OF GEORGIA AT NORTHBOUND AND SOUTHBOUND MM 106.90,
CONTINUING NORTHERLY 4.10 MILES, ENDING IN THE TOWN OF FAIRFAX AT
NORTHBOUND AND SOUTHBOUND MM 111.00

LENGTH OF ROADWAY 21,648.00 FEET = 4.10 MILES
LENGTH OF PROJECT 21,648.00 FEET = 4.10 MILES

THIS PROJECT CONSISTS OF REPLACING THE EXISTING PAVEMENT AND SHOULDERS WITH NEW BITUMINOUS
CONCRETE PAVEMENT, RECLAIMING THE SUBBASE, INSTALLING NEW GUARD RAIL, NEW DRAINAGE AND
REHABILITATION OF EXISTING DRAINAGE, REHABILITATION OR REPLACEMENT OF R.O.W. FENCE, NEW SIGNS,
AND OTHER RELATED SAFETY ENHANCEMENTS ON THE NORTHBOUND AND SOUTHBOUND LANES.

APPENDIX A
10
### Normal Typical Section Using Permeable Base

**Northbound MM 109.00 to MM 109.50 (NB STA. 3173+38 ~ 3199+78')**

The following procedure will be done first:
1. **Cold Plane Entire Depth of Existing Bituminous Pavement (6"-9");**
2. **Remove 1"-2" of Existing Stone Dust Subbase Material to Allow for New Permeable Base.** (Possibly additional material to be removed to match grade at MM 109.00 and MM 109.50, as directed by the Engineer)
3. **Scarify, Regrade, and Recompact.** (This scarifying, regrading, & compacting is to be paid under Item 212.20, Scarifying Pavement--Modified.)

#### Material Item | Thickness Tolerance |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavement (Total Depth)</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>Subbase</td>
<td>1&quot;</td>
</tr>
</tbody>
</table>

**New Pavement -**

- 3/4" Open Graded Asphalt Friction Course
  - 3/4" Bituminous Concrete Pavement (1/2" Type III S over 2" Type II S)
  - 6" Base Course of Bituminous Concrete Pavement, Type I S (Two 3" Lifts)
  - 4" Plant Mixed Base Course (Modified, Permeable Base)

**Shoulders:**

- 3/4" Open Graded Asphalt Friction Course
  - 3/4" Bituminous Concrete Pavement (1/2" Type III S over 2" Type II S)
  - 6" Base Course of Bituminous Concrete Pavement, Type I S (Two 3" Lifts)
  - 4" Plant Mixed Base Course (Modified, Permeable Base)

---

**PARABOLIC DETAILS**

**Face of Guard Rail**

**Guard Rail Detail**

**Normal Typical Section Using Permeable Base**

**Northbound MM 109.00 to MM 109.50 (NB STA. 3173+38 ~ 3199+78')**

The following procedure will be done first:
1. **Cold Plane Entire Depth of Existing Bituminous Pavement (6"-9");**
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3. **Scarify, Regrade, and Recompact.**

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  - 4" Plant Mixed Base Course (Modified, Permeable Base)

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  - 3/4" Bituminous Concrete Pavement (1/2" Type III S over 2" Type II S)
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---

**Normal Typical Section Using Permeable Base**

**Northbound MM 109.00 to MM 109.50 (NB STA. 3173+38 ~ 3199+78')**

The following procedure will be done first:
1. **Cold Plane Entire Depth of Existing Bituminous Pavement (6"-9");**
2. **Remove 1"-2" of Existing Stone Dust Subbase Material to Allow for New Permeable Base.**
3. **Scarify, Regrade, and Recompact.**

**New Pavement -**

- 3/4" Open Graded Asphalt Friction Course
  - 3/4" Bituminous Concrete Pavement (1/2" Type III S over 2" Type II S)
  - 6" Base Course of Bituminous Concrete Pavement, Type I S (Two 3" Lifts)
  - 4" Plant Mixed Base Course (Modified, Permeable Base)

**Shoulders:**

- 3/4" Open Graded Asphalt Friction Course
  - 3/4" Bituminous Concrete Pavement (1/2" Type III S over 2" Type II S)
  - 6" Base Course of Bituminous Concrete Pavement, Type I S (Two 3" Lifts)
  - 4" Plant Mixed Base Course (Modified, Permeable Base)
**SOUTHBOUND NORMAL TYPICAL SECTION**

SB MM 107.56 TO MM 107.74 (SB STA. 3098+37 ~ 3266+49)*

5" COLD PLANE  
8" RECLAIMED STABILIZED BASE / COARSE AGGREGATE-FOR-CONCRETE 
ADDED WHEN NECESSARY TO ATTAIN DESIRED GRADATION: REFER TO 
SUPPLEMENTAL SPECIFICATION-300.20, RECLAIMED-STABILIZED-BASE-

NEW PAVEMENT -  

3/4" OPEN-GRADED-ASPHALT FRICTION COURSE  
3/4" BITUMINOUS CONCRETE PAVEMENT (1/2" TYPE III OVER 2" TYPE II S)  
6" BASE COURSE OF BITUMINOUS CONCRETE PAVEMENT, TYPE I S (TWO 3" LIFTS)  
SHOULders: 3/4" OPEN-GRADED-ASPHALT FRICTION COURSE  
3/4" BITUMINOUS CONCRETE PAVEMENT (1/2" TYPE III OVER 2" TYPE II S)  

NOTE:  
SHALL BE COLD PLANED 1/2" AND OVERLAI
WITH 3/4" OPEN GRADED ASPHALT FRICTION COURSE OVER 1/2" BITUMINOUS CONCRETE PAVEMENT, TYPE III S. (38" WIDTH)

**CROSSOVER TYPICAL SECTION**

3/4" BITUMINOUS CONCRETE PAVEMENT (1/2" TYPE III OVER 2" TYPE II) (PG 64-28) 
15" SUBBASE OF ACCEPTABLE GRAVEL MATERIAL  
SHOULders: 3/4" BITUMINOUS CONCRETE PAVEMENT (1/2" TYPE III OVER 2" TYPE II) (PG 64-28)

**NOT TO SCALE**

PROJECT: GEORGIA - FAIRFAX  
PROJECT NO: B4-0029-1/2661  
DESIGN FEE BID: $10,000/PROJECT/CONSTRUCTION  
PLAN No. IS INK  
SURVEYED by:  
SUNG LEESON DELLA SINTRA  
NOT TO SCALE  
SIDE 4 OF 13
EXISTING TYPICAL SECTION
MM 106.90 TO MM 110.00 (NB & SB)
(FOR REFERENCE ONLY)

FROM 1968 "AS BUILT" PLANS. SENSE THEN, A 1" OVERLAY HAS BEEN ADDED.

EXISTING SAND BORROW
(TYPICAL BOTH SIDES)
(TO BE REMOVED)

SLOPE VARIES

1" TO 2" EXISTING STONE DUST
EXISTING 6" SAND BORROW

EXISTING 3" EXISTING PAVEMENT
**** FROM 1968 "AS BUILT" PLANS.
3" EXISTING PAVEMENT

EXISTING TOPOIL
(BOTH SIDES)

EXISTING BASE
EXISTING SUBBASE

NORTHBOUND NORMAL TYPICAL SECTION
NB MM 107.56 TO MM 107.56 (NB STA. 3297.43 = 3273-38)*
NB MM 107.50 TO MM 108.00 (NB STA. 3199.78 = 3233-17)*
NB MM 108.63 TO MM 110.00 (NB STA. 3259.55 = 3278-95)*

5" COLD PLANE

8" RECLAIMED STABILIZED BASE (COARSE AGGREGATE FOR CONCRETE ADDED WHEN NECESSARY TO ATTAIN DESIRED GRADATION. REFER TO SUPPLEMENTAL SPECIFICATION 30.20. RECLAIMED STABILIZED BASE)

NEW PAVEMENT
7/16" OPEN-GRADED ASHALT FRICTION COURSE

3/4" BITUMINOUS CONCRETE PAVEMENT 1/2" TYPE II S OVER 2" TYPE II S

6" BASE COURSE OF BITUMINOUS CONCRETE PAVEMENT, TYPE I S (TWO 3" LIFTS)

SHOULDER:
7/16" OPEN-GRADED ASHALT FRICTION COURSE

3/4" BITUMINOUS CONCRETE PAVEMENT 1/2" TYPE II S OVER 2" TYPE II S

NEW SUBBASE OF DENSE GRADED CRUSHED STONE

2" TOPSOIL

NEW 8" UNDERDRAIN TO REPLACE EXISTING UNDERDRAIN AS DIRECTED BY THE ENGINEER (MODIFICATION #2)

GEOTEXTILE FOR UNDERDRAIN TRENCH LINING (1" MIN. OVERLAP)
COARSE AGGREGATE FOR CONCRETE (PER SPEC. TABLE 704.02B)

NOTE: BRIDGE 86-N SHALL NOT BE COLD PLAINED OR PAVED.

*STATIONS ARE FROM 1968 "AS BUILT" PLANS.
47. (Continued)
The scarified surface shall then be regraded and recompacted in accordance
with section 301.04, SPECIFIC CONSTRUCTION REQUIREMENTS, subsection (c)
Subbase of Dense Graded Crushed Stone and section 301.05, SURFACE TOLERANCE.

48. 212.03, METHOD OF MEASUREMENT, is hereby modified by deleting the word
“pavement” in the second line and replacing it with the word “subbase.”

49. 212.04, BASIS OF PAYMENT, is hereby modified by adding the word “modified”
between the words “pavement” and “will” in the first line.

50. 212.04, BASIS OF PAYMENT, is hereby further modified by adding the following
pay item:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>212.20</td>
<td>Scarifying Pavement (Modified) Square Yard</td>
</tr>
</tbody>
</table>

SECTION 303 - PLANT MIXED BASE COURSE

51. 303.02, MATERIALS, (b) Gradation, is hereby modified by being deleted in its
entirety and replaced with the following:

<table>
<thead>
<tr>
<th>Screen Size</th>
<th>Design General Limits, % Passing</th>
<th>Production Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/2&quot;</td>
<td>95-100</td>
<td>-</td>
</tr>
<tr>
<td>1&quot;</td>
<td>80-95</td>
<td>±5</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>30-60</td>
<td>±6</td>
</tr>
<tr>
<td>#4</td>
<td>6-20</td>
<td>±7</td>
</tr>
<tr>
<td>#8</td>
<td>3-14</td>
<td></td>
</tr>
<tr>
<td>#200</td>
<td>0-3</td>
<td>-</td>
</tr>
</tbody>
</table>

Asphalt Content, %
Asphalt Cement, PG 64-28
Mixing Temp. Range 200° - 275°F

52. 303.17, BASIS OF PAYMENT, is hereby modified by adding the words “or Plant
Mixed Base Course (Modified)” after the comma in the second line of the first
paragraph.

53. 303.14, BASIS OF PAYMENT, is hereby further modified by adding the following:

Payment will be made under:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>303.25</td>
<td>Plant Mixed Base Course (Modified) TON</td>
</tr>
</tbody>
</table>

SECTION 310 - RECLAIMED STABILIZED BASE

54. SUPPLEMENTAL SPECIFICATION SECTION 310 - RECLAIMED STABILIZED BASE dated May
15, 1995 is hereby made a new section of the specifications, superseding all
previous editions and their modifications.

Modification to this Supplemental follow.