

**Revision 13:**

1. **10/27/14, Page 5, In Section III (A) Producer’s QC, Table 1 Required Tests, revise the following statement, “Upon acceptance into this program, the Producer’s technically competent sampling personnel will be evaluated and inspected on sampling procedures by NCDOT initially and then subsequent 36 month intervals.”, to read,**

“Upon acceptance into this program, the Producer’s technically competent sampling personnel will be evaluated and inspected on sampling procedures by NCDOT initially and then subsequent 60 month intervals.”

2. **10/27/14, Page 44, APPENDIX IX: Technician Training and Evaluation Record, revise MT Form 521 third column header, “36 month Eval”, to read,**

“60 month Eval.”

**Revision 12:**

1. **9/9/2014, Page 3, In Section II (C) Approved Laboratory, Table 1 Required Tests, add a row to the bottom of the table and add the test:**

“High End Temperature True Grade (°C), in the test description column and add AASHTO T315, in the test method reference column.”

2. **9/9/2014, Page 7, In Section III (A)(3) Producer’s Test Report, after the statement, “See Appendix VII that has a list of the minimum required information to be included on a PGAB test report.”, add the statement:**

“Table 1 in Section II (C.) contains the required tests. High End Temperature True Grade is required and any material that does not meet the required grading shall be noted on the test report as “DOES NOT MEET TRUE GRADING: Product not acceptable for use per the North Carolina Performance Graded Asphalt Binder Quality Control/Quality Assurance Program.””

3. **9/9/2014, Page 10, In Section III (C) Quality Assurance (QA) Verification Sample Testing, revise the title to read:**

“Quality Assurance (QA) Sampling and QC/QA Results Evaluation.”

4. **9/9/2014, Page 12, In Section III (C)(3) QC Sample and QA Verification Sample Results Evaluation, in the definition, “Acceptance Limits – a low and high number, either representing a specification, is an allowable numerical range of values determined by the applicable test method.”, revise the definition to read:**

“Acceptance Limits – a statistical low and high number, either representing a specification, is a three deviation numerical range of values determined by the applicable test method.”

5. **9/9/2014, Page 12, In Section III (C)(3) QC Sample and QA Verification Sample Results Evaluation, after the revised definition for Acceptance Limits add a new definition as follows:**

“High End Temperature True Grade - high temperature grading determined from DSR-original, DSR-RTFO, DSR-PAV pass/fail temperature results.”

6. **9/9/2014, Page 12, In Section III (C)(3) QC Sample and QA Verification Sample Results Evaluation, revise the following text, “For each batch of a grade tested by the Producer over the**

**QA inspection interval, the set of QC results are compared to acceptance limit maximum statements in Table 2 by the AMRL accredited testing laboratory. (website title: Performance Graded Binder QC-QA Program Table 2 Acceptance Limits) . The Producer’s responsible personnel at the terminal and elsewhere shall be made immediately aware by the AMRL lab personnel of values beyond the Table 2 acceptance limit maximums for Original binder, RTFO residue, and/or BBR Slope, m-value tests and a comment placed on the test report that states, “Product not acceptable by the North Carolina Performance Graded Asphalt Binder Quality Control/Quality Assurance Program Table 2 maximum limits.”, to read as follows:**

“For each batch of a grade tested over the QC or QA inspection interval, the set of results for a PGAB sample grade must classify as that PGAB grade per the High End Temperature True Grade test to limit the risk to DOT on projects. In the event of recognition of the material grading at a level beyond the high temperature grade, the AMRL lab shall contact the terminal personnel immediately to avoid shipments. The responsible AMRL lab MUST PLACE A COMMENT on the test report that states, “DOES NOT MEET TRUE GRADING: Product not acceptable for use per the North Carolina Performance Graded Asphalt Binder Quality Control/Quality Assurance Program.””

7. **9/9/2014, Page 12, In Section III (C)(3) QC Sample and QA Verification Sample Results Evaluation, remove the following footnote text, “\*Footnote for Table 2: Low limits shall not affect acceptance unless a specification applies. But if the acceptance limits maximum range for Original Binder, RTFO and/or BBR-Slope, m-value is less than the producer’s calculated three deviation control limit maximum for the parameter, the lesser of the two is used for evaluation. An example for PG 64-22 follows: 6.55 is reported for an RTFO test and the calculated three deviation limit is 6.85. We know 6.55 is the lesser of the two numbers so an investigation is warranted after a call to stop shipment is placed. The 6.55 is beyond the Table 2 acceptance maximum for RTFO and shall not be shipped to NC projects.”.**
8. **9/9/2014, Page 12, In Section III (C)(3) QC Sample and QA Verification Sample Results Evaluation, remove the following, “This note limits the risk on DOT projects by triggering an investigation for product that grades at a level (due to stiffening) beyond the original nominal grade.”.**
9. **9/9/2014, Page 13, In Section III (C)(4) Table 2 – Acceptance Limits of QC-QA Samples – All Producers, revise the title, “Table 2 – Acceptance Limits of QC-QA Samples – All Producers”, to read as:**

“Table 2 – Acceptance Limits of QC-QA Samples – All Producers - FOR INVESTIGATION USE REFERENCE BY NCDOT”
10. **9/9/2014, Page 13, In Section III (C)(4) Table 2 – Acceptance Limits of QC-QA Samples – All Producers, add the following as the first sentence:**

“Note for Table 2: Acceptance limit values subject to change.”
11. **9/9/2014, Page 38-39, In Appendix VI: Testing Procedures, in the QC Tests table, QA Verification Tests table, and Independent Assurance (IA) Tests table, add a row to the bottom of the table and add the test:**

“High End Temperature True Grade (°C), in the test description column and add AASHTO T315, in the test method reference column.”
12. **9/9/2014, Page 41, In Appendix VII: QC and QA Verification Test Report Forms, after “R: Signature.”, add another requirement and renumber the list as follows:**

“S. Certifying statement that the material meets AASHTO specifications.”

13. **9/9/2014, Page 41, In Appendix VII: QC and QA Verification Test Report Forms, after “R: Signature.”, add another requirement and renumber the list as follows:**

“T. Certifying statement that the material DOES NOT MEET TRUE GRADING when a high temperature true grade is performed and is out of range. See Section III (C)(3).”

14. **9/9/2014, Page 41, In Appendix VIII: HiCAMS Sample Card Record and Requirements for Producer Sampling Log and Lab Report, (II) Requirements for Producer Sampling Log and Lab Report, after “13. DSR on PAV @ required temperature(s)”, add another requirement and renumber the list as follows:**

“14. Pass/Fail Temperature (High End Grade).”

15. **9/9/2014, Page 49, In APPENDIX XII: Spreadsheet for PGAB Test Data for Submitting to NCDOT, after the column header, “ DTT @ -24 C, Strain [%]:”, insert a new column and header to the right as follows:**

“Jnr @ 3.2 [1/kPa]:” with entry fields set to four decimal places.

16. **9/9/2014, Page 49, In APPENDIX XII: Spreadsheet for PGAB Test Data for Submitting to NCDOT, after the column header, “ Percent Loss/Gain @ 163 C: ”, insert a new column and header to the right as follows:**

“High End Temp True Grade [°C]:” with entry fields set to one decimal place.

17. **9/9/2014, Page 8, In Section III (B)(1) Bill of Lading Requirements, remove item 1 and renumber the list. Incorporate old item 1 into the first paragraph of this section to read as follows:**

“An example Bill of Lading must be included with the QC Plan. The delivery ticket or bill of lading information below is extracted from the North Carolina Department of Transportation Standard Specifications for Roads and Structures Section 1020-1, Delivery and Acceptance of Asphalt Materials which describes the transporting requirements. The Bill of Lading or delivery ticket will have a minimum of the following information on it.”

**Revision 11:**

1. **2/17/2014, Page 12, In Section III Sampling and Testing Procedures, (C)(3) QC Sample and QA Verification Sample Results Evaluation change the term acceptance limit from, “Acceptance Limits – a low and high number representing an allowable numerical range of values determined by the applicable test method. Three deviation upper/lower control limits for a producer’s product shall be used if the range is greater and is still in specification limits.”, to read as follows:**

“Acceptance Limits – a low and high number, either representing a specification, is an allowable numerical range of values determined by the applicable test method.”

2. **2/17/2014, Page 12, In Section III Sampling and Testing Procedures, (C)(3) QC Sample and QA Verification Sample Results Evaluation remove the text and statements: “For each batch of a grade tested by the Producer over the QA inspection interval, the set of QC results and the corresponding NCDOT QA verification sample(s) are compared to acceptance limits statements in Table 2 (website). Note for Table 2: If the acceptance limit range is less than the producer’s calculated three deviation control limit range for the parameter the greater of the two is used for evaluation.” Replace with the following:**

“For each batch of a grade tested by the Producer over the QA inspection interval, the set of QC results are compared to acceptance limit maximum statements in Table 2 by the AMRL accredited testing laboratory. (website title: Performance Graded Binder QC-QA Program Table 2 Acceptance Limits) . The Producer’s responsible personnel at the terminal and elsewhere shall be made immediately aware by the AMRL lab personnel of values beyond the Table 2 acceptance limit maximums for Original binder, RTFO residue, and/or BBR Slope, m-value tests and a comment placed on the test report that states, “Product not acceptable by the North Carolina Performance Graded Asphalt Binder Quality Control/Quality Assurance Program Table 2 maximum limits.”

\*Footnote for Table 2: Low limits shall not affect acceptance unless a specification applies. But if the acceptance limits maximum range for Original Binder, RTFO and/or BBR-Slope, m-value is less than the producer’s calculated three deviation control limit maximum for the parameter, the lesser of the two is used for evaluation. An example for PG 64-22 follows: 6.55 is reported for an RTFO test and the calculated three deviation limit is 6.85. We know 6.55 is the lesser of the two numbers so an investigation is warranted after a call to stop shipment is placed. The 6.55 is beyond the Table 2 acceptance maximum for RTFO and shall not be shipped to NC projects.

This note limits the risk on DOT projects by triggering an investigation for product that grades at a level (due to stiffening) beyond the original nominal grade.

**3. 2/17/2014, Page 13, In Section III Sampling and Testing Procedures, (C)(4) Acceptance Limits of QC-QA Samples – All Producers, Remove the text and statements, “ Note for Table 2: \* Acceptance limits values subject to change.**

**\*\* When an acceptable number of QC data points have been attained from a Producer and the corresponding NCDOT QA verification data point(s), producer-specific acceptance limits will then be determined and sent to the Producer upon request. For an example of typical producer-specific acceptance limits see Appendix X.”**

The text and statements are already included in the Table 2 on the website page.

**4. 2/17/14, Page 13, In Section III Sampling and Testing Procedures, (C)(4) Acceptance Limits of QC-QA Samples – All Producers, the file at the website location has been modified to include “Footnote for Table 2” mentioned in the second 2/17/14 revision.**

The document titled Performance Graded Binder QC-QA Program Table 2 Acceptance Limits has been modified to include the footnote for Table 2:

\*Footnote for Table 2: Low limits shall not affect acceptance unless a specification applies. But if the acceptance limits maximum range for Original Binder, RTFO and/or BBR-Slope, m-value is less than the producer’s calculated three deviation control limit maximum for the parameter, the lesser of the two is used for evaluation. An example for PG 64-22 follows: 6.55 is reported for an RTFO test and the calculated three deviation limit is 6.85. We know 6.55 is the lesser of the two numbers so an investigation is warranted after a call to stop shipment is placed. The 6.55 is beyond the Table 2 acceptance maximum for RTFO and shall not be shipped to NC projects.

**Revision 10:**

**2/19/2013, Page 1-2, Revisions. Remove all revisions and add the statement,**

“See the website for the latest revision updates: Click on <https://connect.ncdot.gov/resources/Materials/Pages/ChemicalLaboratory.aspx> then scroll down to “Resource Type: Programs” and click the document titled Performance Graded Binder QC-QA Program Revisions.”

**2/19/2013, Page 9, Section III (B)(1) Bill of Lading Requirements, after #21’s text, “For the latest issues of certifications, see the Materials and Tests Chemical Laboratory website, add the following text,**

“Click on <https://connect.ncdot.gov/resources/Materials/Pages/ChemicalLaboratory.aspx> then scroll down to “Resource Type: Forms” and click the document titled Asphalt Materials Bill of Lading Standard Attachment.”

**2/19/2013, Page 12, Section III (C)(3), QC Sample and QA Verification Sample Results Evaluation: After this text, “For each batch of a grade tested by the Producer over the QA inspection interval, the set of QC results and the corresponding NCDOT QA verification sample(s) are compared to acceptance limits statements in Table 2 (website).”, add the following text, “Note for Table 2: If the acceptance limit range is less than the producer’s calculated three deviation control limit range for the parameter the greater of the two is used for evaluation.”**

**2/19/2013, Page 12, Section III (C)(4), Table 2 – Acceptance Limits of QC-QA Samples – All Producers, delete the following text, <http://www.ncdot.org/doh/construction/materials/chemical/others.html> NOTE: In Quality Control/Quality Assurance Information click on the title PGAB QC/QA Program Table 2 Acceptance Limits., and replace with, “Click on <https://connect.ncdot.gov/resources/Materials/Pages/ChemicalLaboratory.aspx> then scroll down to “Resource Type: Programs” and click the document titled Performance Graded Binder QC-QA Program Table 2 Acceptance Limits.”**

**2/19/2013, Page 12, Section III (C)(4), Table 2 – Acceptance Limits of QC-QA Samples – All Producers, revise the following statement, “\*\* When an acceptable number of QC data points have been attained from a Producer and the corresponding NCDOT QA verification data point(s), producer-specific acceptance limits will then be determined and sent to the Producer.”, to read, “\*\* When an acceptable number of QC data points have been attained from a Producer and the corresponding NCDOT QA verification data point(s), producer-specific acceptance limits will then be determined and sent to the Producer upon request.”**

**2/19/2013, Page 13, Section III (C)(5) Corrective Action and Investigation by the Producer and NCDOT on QC and QA Verification Samples, add the following text after the first sentence in section (a) Deviation from Acceptance Limits Requirements but Sample is Acceptable, “The NCDOT will allow no more than sixty calendar days for the Producer to submit documentation that will complete the investigation. After that period, action may be taken which could include removal from the approved list.”**

**2/19/2013, Page 19, Section III (D)(4) Corrective Action and Investigation by the Producer and NCDOT on IA – Comparative Samples, add the following text after the fifth sentence in section (a) Deviation from Precision Requirement in Table 3, “The NCDOT will allow no more than sixty calendar days for the Producer to submit documentation that will complete the investigation. After that period, action may be taken which could include removal from the approved list.”**

**2/19/2013, Page 22, Appendix I: Example Model Performance Graded Binder Quality Control Plan, delete the following text, <http://www.ncdot.org/doh/operations/materials/chemical/others.html> NOTE: IN QUALITY CONTROL/QUALITY ASSURANCE INFORMATION CLICK ON THE TITLE NEAUPG MODEL PLAN.”, and replace with, “Click on <https://connect.ncdot.gov/resources/Materials/Pages/ChemicalLaboratory.aspx> then scroll down to “Resource Type: Plans” and click the document titled Performance Graded Binder QC-QA -NEAUPG Model Plan.”**

**2/19/2013, Page 35, Appendix III: NCDOT Section 1020, delete the following text, [http://www.ncdot.org/doh/operations/ps/specifications/specifications\\_provisions.html](http://www.ncdot.org/doh/operations/ps/specifications/specifications_provisions.html) Note: Click on the latest Specification Book, then the section title, Materials (10)”, and replace with,**

“Click on <https://connect.ncdot.gov/resources/Specifications/Pages/default.aspx> then scroll down to select the latest Standard Specifications and Provisions heading.”

**End of Revision 10.**

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**Revision 9:**

**03/15/2012, Page 8, Section III (B) (1) Bill of Lading requirements: Adjust the list to reflect revisions in the NCDOT Standard Specifications for Roads and Structures Section 1020 and reference binder as needed. Remove the existing list and replace with the following:**

1. The information provided by the North Carolina Department of Transportation Standard Specifications for Roads and Structures Section 1020, Delivery and Acceptance of Asphalt Materials.
2. Name of Producer/Supplier and location
3. A statement that the material has been tested and meets AASHTO specifications or is being provided by an approved supplier under Approved Supplier Certification (ASC)
4. The grade of the binder material.
5. The rotational viscosity in Pascal-Seconds (Pa-S) at 135 and 165 degrees C
6. The recommended laboratory mixing and compaction temperature (degrees C for the PGAB)
7. Delivery ticket number
8. Date and time loaded (mm/dd/yyyy AM:PM)
9. Date and time shipped (mm/dd/yyyy AM:PM)
10. State project or purchase order number
11. NCDOT assigned batch number
12. Destination
13. Name of consignee
14. Trailer or car number
15. Producer’s or Supplier’s storage tank and batch number
16. Quantity loaded in tons or gallons (metric tons or liters)
17. Specific gravity or pounds per gallon (kg/L) at 60 degrees F (15.6 degrees C)
18. Loading temperature
19. Net gallons at 60 degrees F (15.6 degrees C)
20. Brand, grade and percentage or quantity of anti-strip additive
21. Stamp, write, print or attach the NCDOT Supplier’s and NCDOT Transporter’s Certification to the delivery ticket as described in Section 1020, Delivery and Acceptance of Asphalt Materials. For the latest issues of certifications, see the Materials and Tests Chemical Laboratory website.

**3/15/2012, Page 39, Appendix VII, QC and QA Verification Test Report Forms:**

Revise “(G) Date sample was taken.” to read, “(G) Date and time sample was taken.”

**End of Revision 9.**

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**01/05/2009, Page 17, Section III (D) (2) IA-Comparative Sample Results Evaluation: Delete the second bulletined statement and replace with the following:**

Set of IA results - all the IA test results for one grade of PGAB during the inspection interval of twice per year as described in this section.

**01/05/2009, Page 15, Section III (D) (1) Comparative Sampling for IA: Delete sentence three of paragraph one and replace with the following:**

In accordance with AASHTO T-40, Sampling Bituminous Materials, except that samples may be taken from a single valve near the bottom of the tank, the Producers’ facility’s technically competent personnel

[as described in their QC Plan] will take Independent Assurance (IA) comparison samples of PGAB at the rate of two – 1 quart comparative samples at random twice each year of each PGAB grade produced or supplied.

**11/03/2008, Page 5, Section III (A), Producer’s QC: Delete sentence three of paragraph one and replace with the following:**

Upon acceptance into this program, the Producer’s technically competent sampling personnel will be evaluated and inspected on sampling procedures by NCDOT initially and then subsequent 36 month intervals.

**10/17/06, Page 49, Appendix III: NCDOT Section 1020: Remove the existing web address and replace with the following:**

[http://www.ncdot.org/doh/preconstruct/ps/specifications/specifications\\_provisions.html](http://www.ncdot.org/doh/preconstruct/ps/specifications/specifications_provisions.html)

**10/17/06, Page 21, Appendix I: Example Model Performance Graded Binder Quality Control Plan: Remove the existing web address and replace with the following:**

<http://www.ncdot.org/doh/operations/materials/chemical/others.html>

**10/17/06, Page 12-13, Section III (C) (4), Table 2 – Acceptance Limits of QC-QA Samples – All Producers : Remove the existing web address and replace with the following:**

<http://www.ncdot.org/doh/operations/materials/chemical/others.html>

**9/11/06, Page 12-13, Section III (C) (4), Table 2 – Acceptance Limits of QC-QA Samples – All Producers : Remove the existing Table 2 body, except Notes, and reference the Department’s website for this section:**

The new Table 2 – Acceptance Limits of QC-QA Samples – All Producers reads as follows: “See the website for the latest updates: <http://www.ncdot.org/doh/construction/materials/chemical/others.html>

NOTE: In Quality Control/Quality Assurance Information click on the title PGAB QC/QA Program Table 2 Acceptance Limits.”

**9/11/06, Page 10-11, Section III (C) (1), Verification Sampling by QA Personnel: Add the following verbiage to the second sentence:**

“...but it should never be used as a required QC sample as it is not taken at random.” This will form the complete sentence, “The Producer may draw a sample at the same time as a duplicate to hold for possible future testing, but it should never be used as a required QC sample as it is not taken at random.”

**9/6/06, Page 12 Section III (C) (3), QC Sample and QA Verification Sample Results Evaluation: Add the following verbiage to the second sentence after bullet four (Last sentence in (3)):**

“...provided that there are enough data points for NCDOT to achieve a sound statistical analysis.” This will form the complete sentence, “After three consecutive two-month intervals of acceptable results with no internal or DOT/Producer investigations pending, the QA verification sample frequency may be reduced to a minimum of once per six months, provided that there are enough data points for NCDOT to achieve a sound statistical analysis.

**9/6/06, Page 10, Section III (C) (1), Verification Sampling by QA Personnel: Delete sentence two with no replacement. This subject is covered in Section III (C) (3).**

“After three consecutive two-month intervals of acceptable results with no internal or DOT/Producer investigations pending, the QA verification sample frequency may be reduced to a minimum of once per six months.”

**9/6/06, Page 5, Section III (A), Producer’s QC: Insert the following sentence after between the fourth and last sentence:**

“In the event Producer’s personnel are discharged from duty or leave, the Producer’s shall contact the NCDOT Asphalt Inspector to schedule an evaluation of any new employee hired.”

**9/6/06, Page 22, Appendix I: Example Model Performance Graded Binder Quality Control Plan: Remove the existing scanned images and reference the Department's website for this section:**

The new Appendix I reads as follows: "See the website for the latest updates:  
<http://www.ncdot.org/doh/construction/materials/chemical/others.html>

NOTE: In Quality Control/Quality Assurance Information click on the title NEAUPG Model Plan."

**9/6/06, Page 49, Appendix III: NCDOT Section 1020: Remove the existing scanned images and reference the Department's website for this section:**

The new Appendix III reads as follows: "See the website for the latest updates:

[http://www.ncdot.org/doh/construction/ps/specifications/specifications\\_provisions.html](http://www.ncdot.org/doh/construction/ps/specifications/specifications_provisions.html) Note: Click on the latest Specification book, then the section title, Materials (10)."

**8/31/06, Page 19, Section III (D)(4)(a), Deviation from Precision Requirements in Table 3: Delete sentence two and sentence three and replace with the following:**

"IANC samples will be retaken by the Producer with NCDOT receiving 4 (FOUR) IA samples. Both parties will repeat testing and if they are in range of method reproducibility limits, results are reported. If the reproducibility is not acceptable from the second set of test results, then a retain from NCDOT will be sent to a mutually acceptable AASHTO accredited laboratory. If the results from the referee (third lab) are not within the reproducibility in Table 3 when compared to the highest and lowest of the three lab values, an investigation will be made to determine the cause of the discrepancy."

**8/31/06, Page 19, Section III (D)(4)(a), Deviation from Precision Requirements in Table 3: Insert the bullet statement below after the sentence, "If the cause is determined to be in the NCDOT's sampling and testing equipment, the NCDOT will take corrective action."**

- "Responsibility for payment to the third party lab belongs to the Producer unless results show that NCDOT's results were beyond the reproducibility limits (Table 3)."

**Add this statement after the new bulletized statement:** "If the third party's results indicate failing material from the referee sample, shipments from that batch will be discontinued and/or rejected."

**8/31/06, Page 18-19, Section III (D) (3) (Table 3) Acceptable Range of Two Test Results:**

22. Delete 21.1 in the (D2S%)\* column and Rotational Viscosity (Pa-s) PG 58-22 row. Replace with 12.1.
23. Delete 29.1 in the (D2S%)\* column and Original Binder: G\*/sin delta (kPa) row. Replace with 17.0.
24. Delete 31.3 in the (D2S%)\* column and RTFO/TFO Residue: G\*/sin delta (kPa) row. Replace value with 22.2.
25. Delete 56.1 in the (D2S%)\* column and PAV Residue: G\*/sin delta (kPa) row. Replace with 40.2.
26. Delete 26.9 in the (D2S%)\* column and BBR Creep Stiffness (Mpa) row. Replace with 17.8.
27. Delete 13.0 in the (D2S%)\* column and Original Binder: G\*/sin delta (kPa) row. Replace with 6.8.

**5/1/06, Page 12-13, Section III (C) (4) (Table 2) Acceptance Limits of QC-QA Samples – All Producers:**

1. Delete 0.296 and replace with 0.275 in the Rotational Viscosity @ 135 (Pa-s) PG 58-22: row.
2. Delete 0.275 and replace with 0.154 in the Rotational Viscosity @ 135 (Pa-s) PG 58-28: row.
3. Delete 0.329 and replace with 0.274 in the Rotational Viscosity @ 135 (Pa-s) PG 64-22: row.
4. Delete 0.420 and replace with 0.293 in the Rotational Viscosity @ 135 (Pa-s) PG 70-22: row.
5. Delete 0.667 and replace with 0.532 in the Rotational Viscosity @ 135 (Pa-s) PG 70-28: row.
6. Delete 1.074 and replace with 0.654 in the Rotational Viscosity @ 135 (Pa-s) PG 76-22: row.
7. Delete 1.65 and replace with 1.77 in the Original Binder: G\*/sin delta (kPa) PG 58-22: row.
8. Delete 1.86 and replace with 2.15 in the Original Binder: G\*/sin delta (kPa) PG 58-28: row.
9. Delete 2.14 and replace with 2.41 in the Original Binder: G\*/sin delta (kPa) PG 64-22: row.
10. Delete 1.85 and replace with 2.03 in the Original Binder: G\*/sin delta (kPa) PG 70-22: row.
11. Delete 2.09 and replace with 2.30 in the Original Binder: G\*/sin delta (kPa) PG 70-28: row.
12. Delete 1.99 and replace with 2.22 in the Original Binder: G\*/sin delta (kPa) PG 76-22: row.
13. Delete 4.27 and replace with 4.72 in the RTFO/TFO Residue: G\*/sin delta (kPa) PG 58-22: row.
14. Delete 4.96 and replace with 6.00 in the RTFO/TFO Residue: G\*/sin delta (kPa) PG 58-28: row.
15. Delete 5.81 and replace with 6.82 in the RTFO/TFO Residue: G\*/sin delta (kPa) PG 64-22: row.
16. Delete 4.56 and replace with 5.50 in the RTFO/TFO Residue: G\*/sin delta (kPa) PG 70-22: row.

17. Delete 5.00 and replace with 5.84 in the RTFO/TFO Residue: G\*/sin delta (kPa) PG 70-28: row.
18. Delete 1268 and replace with 1187 in the PAV Residue: G\*/sin delta (kPa) PG 58-22: row.
19. Delete 1512 and replace with 789 in the PAV Residue: G\*/sin delta (kPa) PG 58-28: row.
20. Delete 1576 and replace with 1004 in the PAV Residue: G\*/sin delta (kPa) PG 64-22: row.
21. Delete 1313 and replace with 732 in the PAV Residue: G\*/sin delta (kPa) PG 70-22: row.
22. Delete 405 and replace with 40 in the PAV Residue: G\*/sin delta (kPa) PG 70-28: row.
23. Delete 515 and replace with 153 in the PAV Residue: G\*/sin delta (kPa) PG 76-22: row.
24. Delete 109 and replace with 71 in the BBR Creep Stiffness (MPa) PG 58-28: row.
25. Delete 84 and replace with 56 in the BBR Creep Stiffness (MPa) PG 64-22: row.
26. Delete 92 and replace with 37 in the BBR Creep Stiffness (MPa) PG 70-22: row.
27. Delete 56 and replace with 30 in the BBR Creep Stiffness (MPa) PG 70-28: row.
28. Delete 0.444 and replace with 0.453 in the BBR Slope -m value PG 58-22: row.
29. Delete 0.391 and replace with 0.410 in the BBR Slope -m value PG 58-28: row.
30. Delete 0.393 and replace with 0.406 in the BBR Slope -m value PG 64-22: row.
31. Delete 0.360 and replace with 0.374 in the BBR Slope -m value PG 70-22: row.
32. Delete 0.361 and replace with 0.365 in the BBR Slope -m value PG 70-28: row.
33. Delete 0.390 and replace with 0.402 in the BBR Slope -m value PG 76-22: row.
34. Delete 4.16 and replace with 5.06 in the RTFO/TFO Residue: G\*/sin delta (kPa) PG 76-22: row.
35. Delete 57 and replace with 54 in the BBR Creep Stiffness (MPa) PG 58-22: row.
36. Delete 70 and replace with 40 in the BBR Creep Stiffness (MPa) PG 76-22: row.

<b><u>NEW TABLE 2</u></b>	<b><i>**Acceptance Limits of QC-QA Samples – All Producers</i></b>	
Condition:	** PG Grade Acceptance Limits	Test Method Reference:
Rotational Viscosity @ 135 (Pa-s)	PG 58-22: 0.275-3.00	AASHTO T 316
	PG 58-28: 0.154-3.00	
	PG 64-22: 0.274-3.00	
	PG 70-22: 0.293-3.00	
	PG 70-28: 0.532-3.00	
	PG 76-22: 0.654-3.00	
Original Binder: G*/sin delta (kPa)	PG 58-22: 1.00-1.77	AASHTO T 315
	PG 58-28: 1.00-2.15	
	PG 64-22: 1.00-2.41	
	PG 70-22: 1.00-2.03	
	PG 70-28: 1.00-2.30	
	PG 76-22: 1.00-2.22	
RTFO/TFO Residue: G*/sin delta (kPa)	PG 58-22: 2.20-4.72	AASHTO T 315
	PG 58-28: 2.20-6.00	
	PG 64-22: 2.20-6.82	
	PG 70-22: 2.20-5.50	
	PG 70-28: 2.20-5.84	
	PG 76-22: 2.20-5.06	
PAV Residue: G*/sin delta (kPa)	PG 58-22: 1187-5000	AASHTO T 315
	PG 58-28: 789-5000	
	PG 64-22: 1004-5000	
	PG 70-22: 732-5000	

	PG 70-28: 40-5000	
	PG 76-22: 153-5000	
BBR Creep Stiffness (MPa)	PG 58-22: 54-300	AASHTO T 313
	PG 58-28: 71-300	
	PG 64-22: 56-300	
	PG 70-22: 37-300	
	PG 70-28: 30-300	
	PG 76-22: 40-300	
BBR Slope -m value	PG 58-22: 0.300-0.453	AASHTO T 313
	PG 58-28: 0.300-0.410	
	PG 64-22: 0.300-0.406	
	PG 70-22: 0.300-0.374	
	PG 70-28: 0.300-0.365	
	PG 76-22: 0.300-0.402	

**7/8/05, page 69, Required Signatures: Delete this page with no replacement.**

**7/8/05, page 10 , Section III (B) (2), Retention and Reporting of Data: Delete sentence one of bullet one and replace with the following:**

Submission of certified test data to the NCDOT shall also be done by populating the spreadsheet in Appendix XII.

**7/8/05, page 10, Section III (C) (1), Verification Sampling by QA Personnel: Delete sentence two of paragraph one and replace with the following:**

After three consecutive two-month intervals of acceptable results with no internal or DOT/Producer investigations pending, the QA verification sample frequency may be reduced to a minimum of once per six months.

**7/8/05, page 10, Section III (C) (3), QC Sample and QA Verification Sample Results Evaluation: Delete sentence seven of paragraph one and replace with the following:**

After three consecutive two-month intervals of acceptable results with no internal or DOT/Producer investigations pending, the QA verification sample frequency may be reduced to a minimum of once per six months

**3/15/2005, Page 12-13, Section III (C) (4) (Table 2) Acceptance Limits of QC-QA Samples – All Producers:**

1. Delete 0.301 and replace with 0.296 in the Rotational Viscosity @ 135 (Pa-s) PG 58-22: row.
2. Delete 0.308 and replace with 0.275 in the Rotational Viscosity @ 135 (Pa-s) PG 58-28: row.
3. Delete 0.326 and replace with 0.329 in the Rotational Viscosity @ 135 (Pa-s) PG 64-22: row.
4. Delete 0.375 and replace with 0.420 in the Rotational Viscosity @ 135 (Pa-s) PG 70-22: row.
5. Delete 0.624 and replace with 0.667 in the Rotational Viscosity @ 135 (Pa-s) PG 70-28: row.
6. Delete 1.13 and replace with 1.074 in the Rotational Viscosity @ 135 (Pa-s) PG 76-22: row.
7. Delete 1.61 and replace with 1.65 in the Original Binder: G\*/sin delta (kPa) PG 58-22: row.
8. Delete 1.84 and replace with 1.86 in the Original Binder: G\*/sin delta (kPa) PG 58-28: row.
9. Delete 2.18 and replace with 2.14 in the Original Binder: G\*/sin delta (kPa) PG 64-22: row.
10. Delete 1.92 and replace with 1.85 in the Original Binder: G\*/sin delta (kPa) PG 70-22: row.
11. Delete 1.99 and replace with 2.09 in the Original Binder: G\*/sin delta (kPa) PG 70-28: row.
12. Delete 2.02 and replace with 1.99 in the Original Binder: G\*/sin delta (kPa) PG 76-22: row.
13. Delete 4.04 and replace with 4.27 in the RTFO/TFO Residue: G\*/sin delta (kPa) PG 58-22: row.
14. Delete 4.92 and replace with 4.96 in the RTFO/TFO Residue: G\*/sin delta (kPa) PG 58-28: row.
15. Delete 5.84 and replace with 5.81 in the RTFO/TFO Residue: G\*/sin delta (kPa) PG 64-22: row.

16. Delete 4.59 and replace with 4.56 in the RTFO/TFO Residue: G\*/sin delta (kPa) PG 70-22: row.
17. Delete 4.16 and replace with 5.00 in the RTFO/TFO Residue: G\*/sin delta (kPa) PG 70-28: row.
18. Delete 1289 and replace with 1268 in the PAV Residue: G\*sin delta (kPa) PG 58-22: row.
19. Delete 1714 and replace with 1512 in the PAV Residue: G\*sin delta (kPa) PG 58-28: row.
20. Delete 1540 and replace with 1576 in the PAV Residue: G\*sin delta (kPa) PG 64-22: row.
21. Delete 1345 and replace with 1313 in the PAV Residue: G\*sin delta (kPa) PG 70-22: row.
22. Delete 862 and replace with 405 in the PAV Residue: G\*sin delta (kPa) PG 70-28: row.
23. Delete 547 and replace with 515 in the PAV Residue: G\*sin delta (kPa) PG 76-22: row.
24. Delete 133 and replace with 109 in the BBR Creep Stiffness (MPa) PG 58-28: row.
25. Delete 83 and replace with 84 in the BBR Creep Stiffness (MPa) PG 64-22: row.
26. Delete 97 and replace with 92 in the BBR Creep Stiffness (MPa) PG 70-22: row.
27. Delete 131 and replace with 56 in the BBR Creep Stiffness (MPa) PG 70-28: row.
28. Delete 0.441 and replace with 0.444 in the BBR Slope -m value PG 58-22: row.
29. Delete 0.379 and replace with 0.391 in the BBR Slope -m value PG 58-28: row.
30. Delete 0.395 and replace with 0.393 in the BBR Slope -m value PG 64-22: row.
31. Delete 0.364 and replace with 0.360 in the BBR Slope -m value PG 70-22: row.
32. Delete 0.354 and replace with 0.361 in the BBR Slope -m value PG 70-28: row.
33. Delete 0.394 and replace with 0.390 in the BBR Slope -m value PG 76-22: row.

<u><b>NEW TABLE 2</b></u>	<b>**Acceptance Limits of QC-QA Samples – All Producers</b>	
Condition:	** PG Grade Acceptance Limits	Test Method Reference:
Rotational Viscosity @ 135 (Pa-s)	PG 58-22: 0.296-3.00	AASHTO T 316
	PG 58-28: 0.275-3.00	
	PG 64-22: 0.329-3.00	
	PG 70-22: 0.420-3.00	
	PG 70-28: 0.667-3.00	
	PG 76-22: 1.074-3.00	
Original Binder: G*/sin delta (kPa)	PG 58-22: 1.00-1.65	AASHTO T 315
	PG 58-28: 1.00-1.86	
	PG 64-22: 1.00-2.14	
	PG 70-22: 1.00-1.85	
	PG 70-28: 1.00-2.09	
	PG 76-22: 1.00-1.99	
RTFO/TFO Residue: G*/sin delta (kPa)	PG 58-22: 2.20-4.27	AASHTO T 315
	PG 58-28: 2.20-4.96	
	PG 64-22: 2.20-5.81	
	PG 70-22: 2.20-4.56	
	PG 70-28: 2.20-5.00	
	PG 76-22: 2.20-4.16	
PAV Residue: G*sin delta (kPa)	PG 58-22: 1268-5000	AASHTO T 315
	PG 58-28: 1512-5000	
	PG 64-22: 1576-5000	
	PG 70-22: 1313-5000	
	PG 70-28: 405-5000	
	PG 76-22: 515-5000	

BBR Creep Stiffness (MPa)	PG 58-22: 57-300	AASHTO T 313
	PG 58-28: 109-300	
	PG 64-22: 84-300	
	PG 70-22: 92-300	
	PG 70-28: 56-300	
	PG 76-22: 70-300	
BBR Slope -m value	PG 58-22: 0.300-0.444	AASHTO T 313
	PG 58-28: 0.300-0.391	
	PG 64-22: 0.300-0.393	
	PG 70-22: 0.300-0.360	
	PG 70-28: 0.300-0.361	
	PG 76-22: 0.300-0.390	

**10/27/2004, Page 4, Section III (A) Producer’s QC: Delete sentence two of paragraph one and replace with the following:**

Materials will be sampled in accordance with AASHTO T-40, Sampling Bituminous Materials, except that samples may be taken from a single valve near the bottom of the tank.

**10/27/04, Page 5, Section III (A) (1) Sampling for QC: Delete sentence two of paragraph one and replace with the following:**

In accordance with AASHTO T-40, Sampling Bituminous Materials, except that samples may be taken from a single valve near the bottom of the tank, the Producers’ facility’s technically competent personnel [as described in their QC plan] will take two-1 quart samples in a appropriate sealed container of each batch and PGAB grade available on any given day.

**10/27/04, Page 10, Section III (C) Quality Assurance (QA) Verification Sample Testing: Delete sentence two of paragraph one and replace with the following:**

Materials will be sampled in accordance with AASHTO T-40, Sampling Bituminous Materials, except that samples may be taken from a single valve near the bottom of the tank.

**10/27/04, Page 10, Section III (C) (1) Verification Sampling by QA Personnel: Delete sentence one of paragraph one and replace with the following:**

In accordance with AASHTO T-40, Sampling Bituminous Materials, except that samples may be taken from a single valve near the bottom of the tank, the NCDOT shall take verification samples, random and independent of QC samples, of PGAB at the rate of one – 1 quart samples at random once each two months or 20,000 tons (4,620,000 gallons) per grade per lot whichever is less until three consecutive results comply with the program requirements.

**10/27/04, Page 16, Section III (D) (1) Comparative Sampling for IA: Delete sentence three of paragraph one and replace with the following:**

In accordance with AASHTO T-40, Sampling Bituminous Materials, except that samples may be taken from a single valve near the bottom of the tank, the Producers’ facility’s technically competent personnel [as described in their QC Plan] will take Independent Assurance (IA) comparison samples of PGAB at the rate of two – 1 quart comparative samples at random once each year of each PGAB grade produced or supplied.

**10/27/04, Page 58, Appendix VII: QC and QA Verification Test Report Forms: Delete letter F and its contents.  
Correct the lettered list.**

**10/27/04, Page 59, Appendix VII: QC and QA Verification Test Report Forms: Delete letter R. and replace with the following:**

R. Technician's name.

**Note: Then correct the lettered list.**

**10/27/04, Page 12, Table 2-Acceptance Limits of QC-QA Samples – All Producers: Delete the contents of the table row, RTFO/TFO Residue:  $G^*/\sin \delta$  (kPa), PG 70-28: 2.59-4.51, and replace with the following:**

PG 70-28: 2.20-4.51

**10/27/04, Page 12, Table 2-Acceptance Limits of QC-QA Samples – All Producers: Delete the contents of the table row, RTFO/TFO Residue:  $G^*/\sin \delta$  (kPa), PG 76-22: 2.33-4.16, and replace with the following:**

PG 76-22: 2.20-4.16

**10/27/04, Page 19, Section D (4) (a), Deviation from Precision Requirement in Table 3: Delete the sentence two of paragraph one and replace with the following:**

IANC samples will be retaken and both parties will repeat testing and if they are then in range of method deviation limits the results are reported.

**10/27/04, Page 61, Appendix VIII (II), Requirements for Producer Sampling Log and Lab Report: Correct the numbered list.**

**10/27/04, Page 63, Appendix X: Producer Acceptance Limits for PGAB Test Methods: Delete the numbers under the Results header in row 1, 4, 6, 7, 9, and 12 and replace with the following:  
3.00, 1.00, 2.20, 5000, 300, 0.300.**