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Rutland City BRF 3000 (2014036)
SUBMITTAL 71

To

Timothy Pockette, PE

Topic BRF3000 Subm 71 Rutland City Asphalt Paving QA QC Plan

Status Submitted

Message Tim,
Please see attached KCC Asphalt Paving QA QC Plan for review.

If you have any questions please let us know.

Thanks,
Michael Martin

Courtesy Copy

Volker H.D. Burkowski

From

Mike Martin

Signed by

Date

9/16/15

Proceed as Indicated

Owner Authorized Representative

Date

Kubricky Construction Corporation

Quality Control Plan

Project: Rutland City

State No.: BRF 3000(16)

Location: Rutland County

Date: September 9, 2015

Item Nos.: 490.30 Superpave Bituminous Concrete Pavement

Mix Types: IIS, IIIS & IVS
65 Gyrations

Producer: Wilk Paving Inc.

Location: Business Route 4
Rutland, VT

Plant Type: Cedar Rapids – 5 ton Batch

Plan Submitted By: Volker Burkowski
Kubricky Construction Corp.

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1. APPLICABLE SPECIFICATIONS

The relevant specifications for all Hot Mix Asphalt activities are as indicated below:

Standard Specifications

This QC Plan applies to all production by the following sections of 2011 Vermont Standard Specifications:

Section 106.03 & 490: Hot Mix Asphalt Pavement
Section 702.02 Performance Grade Binder
Section 704.10 Aggregate for Bituminous Concrete Pavement

Supplemental Specifications

The Supplemental Specifications for construction dated 2011 as modified in contract documents and Special Provision Asphalt Price Adjustment, shall apply to this contract.

Project Special Provisions

General Special Provisions dated Dec. 7, 2010

2. PROJECT QUALITY CONTROL ORGANIZATION

Plan Administrator

Art Cross – Atlantic Testings

The QC Plan Administrator has responsibility and authority for the following items:

- Development and submission of this QC Plan to VTrans for approval.
- Responsible for assuring that all elements of the plan are carried out and has full authority to direct any and all actions necessary to control the quality of the material at the plant and field.
- Responsible for overseeing all aspects of Quality Control for the duration of the project, including at production facility as well as at jobsite.
- Will ensure that the materials supplier(s) has the required certifications, as well as a qualified production facility and laboratory.
- May designate a lead person(s) onsite for daily communications with Resident Engineer. Administrator will have direct communications with the responsible person(s) on site and at the production facilities for this project. Administrator will be available to respond to the engineer within one hour upon request.
- May also suspend all production operations if materials are not in conformance with required specifications.
- Will review and evaluate QC documentation. Has the authority to make or recommend changes based on said review.
- Administrator has the authority to make and enforce decisions regarding this project.
- May also act as the Process Control Manager, Process Control Technician, or Density Technician.
- Dale Bingham or Corey Burke may be submitted as the Plan Administrator upon notification to the Engineer.

Production Quality Control Personnel

The production Quality Control personnel by Wilk Paving Inc. will be responsible for all lab duties and to perform quality control as needed to assure the quality of material being produced is met. Personnel assigned to perform QC sampling, testing, and inspection of hot mix asphalt materials are identified in the table below.

QC Position	Name & Company	NETTCP Cert. #'s
QC Manager/Plan Administrator	Art Cross, Atlantic Testing	426
QC Technician	Seth Widli*	837m
QC Technician	Andrew Elms (alternate)*	190m

Note: * indicates personal at plant

QC personnel have the responsibility and authority for the following items:

- Implementing the QC requirements contained in this QC Plan including sampling of materials, testing of materials, Preparing and submitting of standard test reports for each test completed.
- If materials and operations that fall out of JMF action or suspension limits changes will be made to insure the product is acceptable.
- Identify or Suspend production of HMA materials that appear unacceptable or not in compliance with current specifications, upon notification of the QC Manager and Agency Personnel.

Placement Quality Control Personnel

Paving Superintendent

Jeffrey Russo, Kubricky Construction Corp

Paving Foreman

Jason Parent, Kubricky Construction Corp.

Dan Lashway, Kubricky Construction Corp.

In-Place Density Monitoring Technician.

Atlantic Testing Laboratories, Inc.

3. QUALITY CONTROL LABORATORIES

The laboratory to be used on this project will be located in Rutland, VT and owned by Wilk Paving, Inc. and inspected by VAOT prior to the commencing of production for the above project. Refer to JMF for this project and Materials control section below and attached appendix C (test list).

4. MATERIALS CONTROL

The types, sources, properties and procedures for storing of materials to be used for HMA category are as indicated below.

Material Types and Sources of Supply

- ¾", ½", 3/8" crushed stone-
 - o Wallingford Crushed Stone, VT
- Manufactured Sand-
 - o Wallingford Crushed Stone, VT
- Natural Sand-
 - o Elnicki Pit, North Clarendon, VT
- RAP (Recycled Asphalt Pavement).
 - o Wilk Paving, Rutland, VT
- PG Asphalt Binder – Reference the approved mixed design
- Bag house fines produce by plant and can be controlled with a meter
- Anti-strip: LOF 6500

Material Properties and Mix Designs

The materials and Job Mix Formula was designed in Wilk Paving Inc lab located in Rutland, VT and it was done according the AASHTO M-323 Superpave Volumetric Mix Design:

- SP15-975 Type IVS
- SP15-976 Type IIIS
- SP15-977 Type IIS
- 65 gyration 15% RAP with 58-28 from Parco, West Athens or other sources that are approved by VAOT.

Processing of Existing Materials

The binder content and gradation of the RAP will be determined on a daily basis and additionally during construction of the stockpile in accordance with ASSHTO T-164, or T-308an effort will be made to have sufficient quantity to do the entire job. The binder content and moisture of the RAP will be determined daily in accordance with ASSHTO T-164, or T-308. In addition, the RAP binder content may be determined as the RAP stockpile is constructed. Automated set points will be based on a running average of the most recent 3 test results. If the binder content varies more than 0.5% from an average, additional test will be run to confirm and adjust automated set points. If the moisture content varies more than 1% from the running average, additional tests will be run to verify moisture content and changes then will be made to automated set point. While producing this mix if the PCT finds that the RAP is affecting the quality of mix. The feed percentages may be reduced but cannot be adjusted no more than 5% of JMF.

Prior to offloading PGB for the above referenced job slips will be checked for proper grade and stored in a designated storage tank at required temperatures.

Bag house fines are self-contained in plant during production and they are introduced through a mechanical meter. The meter has an adjustable range of 0-60 htz. The amount of baghouse fines being returned into the mix will be regulated so that when combined with the other mineral aggregates, the desired JMF is achieved.

Material Storage and Stockpiling

Care shall be taken to maintain consistent stockpile uniformity. Stockpiles shall be kept in a neat and orderly manner. Stockpiles will be separated by distance so as not to allow contamination. Aggregate stockpiles will be sampled and grain size analysis performed at least once a day. In addition to daily required testing Samples may be obtained when the stockpile is constructed. As the stockpile is being built should two consecutive samples be more than 10% off of the mean hauling will be stopped until the material is brought back into tolerance. Samples will be obtained in accordance with AASHTO T-2. Thin and Elongated particles and percent fractured faces of particles retained on the 4.75 mm sieve will be determined during these tests, or if done separately, at least once each day of production. The process control technician will be required to remove any and all materials that contaminate a stockpile. Specific Gravities will be performed on the stockpiled materials at the rate of 1 per week, or every 5,000 tons of material used whichever is greater, and when mix test results indicate a zero or negative absorption. Additionally aggregate specific gravities maybe performed as the stockpile is being constructed at the rate of one test per 5,000 tons for informational purposes and to determine the variability in the pile.

5. QUALITY CONTROL SAMPLING AND TESTING

Lot and Sub-lot Sizes

Sampling will be performed through stratified random sampling. A lot shall consist of 3,000 tons of approved mix design. Lots will be broken down into 500 ton sub-lots.

Random Sampling Plan

Random sample points will be selected for each sub-lot by using random number tables and procedures contained in ASTM D3665 or an electronic random number generator. Random numbers will be supplied to the Agency at their request. The numbers will be recorded on standard forms and placed into project records and shared with Agency inspectors at the beginning of each day. The contractor reserves the option of taking additional test should he deem necessary for process control.

Sample Identification System

QC tests will be numbered sequentially and begin with a Mix-1 (ex IV-3 type 4 test3) designation. Process control tests will also be numbered sequentially and begin with a PC-1 designation. All test data, partial or complete will be recorded in the database provided by VAOT.

QC Sampling and Testing Requirements

1. Sampling of Stockpiles
 - a. Gradation of stockpiles, and % fractured faces, Thin & Elongated (dry sieve only) Once per day
 - b. Aggregate specific gravities. Initially and once per week or every 5,000 ton per material, whichever is greater
 - c. Rap Binder content, RAP moisture. Once per day

2. Sampling of HMA
 - a. Once every 500 tons to determine volumetric properties, binder content and gradation.
 - b. Additional test will be performed when necessary. They will be called "Process Control Checks".
 - c. Test results will be compared to action and suspension limits found in Appendix A.

3. Temperature Recordation
 - a. Mix temperature at plant– every 250 tons.

Test methods used can be located in Appendix C (Test Method)

QC Test Result Reporting

QC sampling and testing of materials will be documented on the Agency software program. All QC tests will be recorded complete and made available to the resident engineer and the plan administrator. All QC data will be provided to the Agency utilizing software provided by the Agency. The data will be provided to the Agency at the completion of the project, end of the production season, upon request or whichever occurs first. The report will show the project name and number, item designation, date, time and ticket number and designated test number. The report will include slip ac, extracted ac, gradation, and volumetric properties. All testing will be performed utilizing calibrated / verified testing equipment in accordance with VAOT specifications. Records of the equipment calibrations / verifications will be on file at the plant laboratory, and are available for review upon request.

QC sampling of PG Binder will be sampled by Wilk in conjunction with Agency Acceptance sampling of binder. Samples will be labeled and stored at Wilk facility and held until Agency results are available. If results meet specifications, samples will be stored for later use; however, if results do not meet specifications, Wilk will send out to their lab to verify test results.

6. PRODUCTION FACILITY MANAGEMENT

The activities and procedures to be followed for quality control production of Hot Mix Asphalt materials are as indicated below.

Schedule of Production Operations

Wilk Asphalt Inc will provide the VAOT Bituminous Concrete Field Unit Supervisor and the Resident Engineer with a reasonably achievable schedule no later than 2 days before any anticipated production of HMA. The schedule will identify the estimated production, quantity, material type and anticipated start time. Tentative schedules will be provided weekly on Thursday's and confirmation on Friday's to reasonably project the following week's schedule. The contractor will also keep Agency personnel apprised of any changes in schedule.

Production Facilities & Equipment

Wilk Asphalt will produce the hot mix or mixes for the project. The plant is located on Ripley Road in Rutland, VT. This plant will be approved by the Vermont Agency of Transportation and will meet the requirements for bituminous hot mix plants as contained in AASHTO M 156.

It is a Cedar Rapids Batch plant. The automation that is used to run the plant is a Seltec Premium system. The plant has seven cold bins.

The laboratory used on this project is located at the asphalt plant on Ripley Road, Rutland, VT and inspected by VAOT prior to the commencing of production for the above project

Pre-Production QC Activities

The asphalt plant Operator(s) will inspect the plant prior to each production day to insure that it is in proper working order, and meets the required specifications.

- Gradation on stockpiles that will be used in approved JMF.
- Run aggregate moistures (drum plant only)
- Run RAP moisture
- Determine, record and share with Agency inspector random numbers and sample points for the production day
- Verify production schedule and anticipated production totals for determination of lots and sub-lots with Agency inspector.
- Verify Job Mix Formula, mix type, materials to ensure proper storage and quantity.
- Turn on any equipment and inspect for proper operation.
- Perform any calibration and/or verification of lab equipment.

Production QC Activities

The asphalt plant operator will also make periodic inspections during production, and have the authority to halt production if equipment failure renders the plant incapable of producing satisfactory mix, or if unsafe conditions exist at the plant site.

Temperature at the start of production and after a long shutdown period (45minutes or longer) shall be checked on the first couple of trucks after startup. The temperature of the mix in the truck shall be uniform and adequate.

- Ensure the QC plan is being followed perform routine sampling and testing as outlined in this QC plan, prepare and submit standard test forms, Plot QC test results on control charts and evaluate to ensure process is under control.
 - Communicate with on-site field techs.
 - Monitor and visually inspect production and process to assure quality so that practices or materials to the relevant specifications or QC plan are identified.
 - Make and discuss corrective action if material falls out of action or suspension limits with plant foremen and plan administrator and Agency inspector.
 - The PCT and the plant operator shall have continuous communication capability. There shall be a properly operating communication system between the plant and paving foremen. The PCT shall make the Agency representative aware of any process changes. If the plant ceases production for any quality related failures the Plan Administrator or designee shall participate with the Engineer in the determination of resumption of HMA. Communication systems shall be capable of transmitting voice and essential data among all parties.
 - Termination Test: In the event that the first two sub lot test results indicate a sub-par PWL for voids may occur, the supplier (Pike Industries Inc.) reserves the right to request the execution of a lot/day termination test. This termination test will be the final test used to calculate the lot PWL. This option will be executed after consultation with the Engineer.
 - In the event of scheduled low production days or when Method Specifications for acceptance are in place, The QC testing frequencies will remain the same as above however, additional process control samples will be taken to monitor quality. The producer shall plan their operations to minimize low production days and intermittent operations this is however job specific.
 - Personnel Substitution Personnel may have to be rotated during this project due to production demands. Replacements will be selected from the list submitted. The replacement will have prior experience with the plant and be thoroughly introduced to the plant and project prior to assuming a role under this plan the engineer will be notified of any personnel changes.
 - Equipment Substitution Equipment may have to be rotated during this project to meet production demands. Replacements will be selected from the list submitted. Confirmation of the adequacy, accuracy and reliability of the substitute equipment will be available on request no later than the installation of the substitute.

Production Facility Control Charts

The contractor shall maintain linear control charts showing individual test measurements for slip asphalt content gradation, VMA, mix temperature and voids. As a minimum, the control charts shall identify the project name and number, the contract item number, the test number, each test parameter, upper and lower suspension limits, job aim, upper and lower action limits, and the contractor's test result. In addition a notation on the control charts will be made when changes are made in the process. A sample control chart is located in appendix B.

The contractor will use the control charts as part of the process control system for identifying potential problems and assignable cause before they occur. The plan administrator and process control technician(s) shall have the authority and responsibility to alter operations based on information contained on the control charts. Control charts

shall be kept and available to the engineer during production hours, and shall be kept current. Hard copies of all test results will be kept in a loose-leaf binder and made available within one hour of completion of the test. Quality Control Charts will be posted on the wall of the Laboratory.

Procedures for Corrective Action on Non-Conforming Materials

After the running of each test, it will be compared to the action and suspension limits found in appendix A and see if HMA is within the specifications.

- If tests are found out of spec, Pike Industries will identify the cause and take corrective action depending upon reason for non-specification material and the plan administrator will be notified.
- Possible corrective action to resolve the following non-conforming materials:
 - o Voids, VMA:
 - Inspect batch ticket to assure that batch ticket weights, tare weights, RAP ac content and moisture are not in error.
 - Sand blend will be checked to assure proper proportions of fine aggregate and adjusted if needed with the cold feeds.
 - Batch weights on the JMF will be changed to bring material back into compliance.
 - Check Plant feeders and dust system to make sure they are running properly and all materials are being fed into the plant at the desired proportions.
 - Calibration of cold feeds or Binder (Drum Plant only) will be done in the event that the most common corrective actions do not bring materials into compliance or if there is reason to believe that calibrations have been compromised.
 - AC content adjustment will be made if the gradation is found to be within reasonable compliance with the JMF.
 - Check Hot Bins (Batch Plant only) will be checked to verify plant operation if it is found that the stockpiles and cold feeds are acceptable. The plant operations will be analyzed and corrected if needed.
 - Check moisture, gradation and AC content of RAP to ensure that the plant is being fed with the correct pile and make sure the moisture is the same after a rain event.
 - Check moisture of aggregates to ensure to the right moisture content is being used after a rain event.
 - Check specific gravities of aggregate
 - o Gradation
 - Check stockpiles to ensure proper gradation and if found out of tolerance the material will be removed from stockpile.
 - Check plant feeders and dust system to ensure right material is being feed to the plant. If not corrective action will be taken.
 - Batch weight and cold feed percentages may be adjusted to get gradation back into specification.
 - Check hot bin gradations for batch plants only will be checked to verify plant operation if it is found that the stockpiles and cold feeds are acceptable. The plant operations will be analyzed and corrected if needed.
 - Check cold feed calibration for drum plants will be done in the

event that the most common corrective actions do not bring materials into compliance or if there is reason to believe that calibrations have been compromised.

- If two consecutive QC test fall outside the suspension limits production will be shut down, and corrective actions will be taken to address the problem.
- If two consecutive QC test fall outside the action limits and indicate that the process is deviating from the JMF, corrective action will be taken to bring the material closer to the JMF. If through corrective action, the JMF is not reasonably achievable a request to change the JMF will be submitted to the Agency.
- The plan administrator, Agency Inspector and field personal will be notified of any changes.

Production QC Inspection Reporting

All QC test will be put into the VAOT data base provided by them.

- Mix tests
- Temperatures
- Stockpile gradations
- Control charts

All test data will be available by request.

7. AMENDMENT #1

Wilk Asphalt Inc. has been given full authority by Kubricky Construction Corporation to produce the Superpave Bituminous Concrete Material for the Rutland Bridges Project. This authority is given to streamline the quality control process and allow Wilk Asphalt to make changes or adjustments, within the VAOT specifications, at their discretion. The personnel responsible for these decisions will be Dale Bingham or Corey Burke, Process Control Manager, and the quality control staff at Wilk Asphalt.

APPENDIX A

ACTION AND SUSPENSION LIMITS

APPENDIX B

SAMPLE CONTROL CHART

APPENDIX C

TEST LIST

AASHTO

T-2	Sampling of Aggregates
T-27	Sieve Analysis of Fine and Coarse Aggregates (Dry Sieving Only)
T-30	Mechanical Analysis of Extracted Aggregate
T-40	Sampling Bituminous Materials
T-84	Specific Gravity and Absorption of Fine Aggregate ¹
T-85	Specific Gravity and Absorption of Coarse Aggregate
T-164	Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
T-166	Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens
T-168	Sampling Bituminous Paving Mixtures
T-209	Maximum Specific Gravity of Bituminous Paving Mixtures
T-248	Reducing Field Samples of Aggregate to Testing Size
T-255	Total Moisture Content of Aggregate by Drying
T-269	Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
T-308	Determining the Asphalt Binder Content of Hot-Mix Asphalt (HMA) by the Ignition Method
T-312	Preparing and Determining the Density of Hot-Mix Asphalt (HMA) Specimens by Means of the Superpave Gyrotory Compactor

OTHER

VT-AOT-MRD 10-94	Vermont Test for Effectiveness of Anti-Strip Additive In Asphalt Cement
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