



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0016

JOHN ELIAS BALDACCI
GOVERNOR

DAVID A. COLE
COMMISSIONER

November 13, 2009
Subject: **Benton**
Federal Project No: STP-1285(200)X
State Project No. 012852.00
Amendment No. 2

Dear Sir/Ms:

Make the following changes to the Bid Documents:

In the Bid Book (page 31), "CONSTRUCTION NOTES", Item 308.36, Full Depth Recycling With Cement, **CHANGE** the station number under Left to read as follows **154+00-243+60** and the station number under Right to read as follows **154+00-241+62.** Make this change in pen and ink.

In the Bid Book (page 36), "GENERAL NOTES", Note 15; **CHANGE** "All Pavement; the required depth of pavement will be the same as the existing concrete." to read as follows; "All Pavement; the required depth of pavement will be the same as the existing **pavement.**" Make this change in pen and ink.

In the Bid Book (page 55), "SPECIAL PROVISION, SECTION 105, CONTROL OF WORK, (LIMITATION OF OPERATION)", **DELETE**, in its entirety, Note #6 and **REPLACE** it with the following in pen and ink; "6. **Any shoulder area which is disturbed during excavation of cross pipes will be repaired at the contractor expense with PMRAP/Cement.**"

In the Bid Book (page 63), **REMOVE** "SPECIAL PROVISION, SECTION 308, Full depth Reclamation with Cement)", 1 page dated September 11, 2009 and **REPLACE** with the attached "SPECIAL PROVISION, SECTION 308, Full depth Reclamation with Cement)", 1 page dated November 12, 2009.

In the Bid Book (pages 64 thru 70), **REMOVE** "SPECIAL PROVISION, SECTION 308, FULL DEPTH RECYCLING WITH CEMENT", 7 pages dated June 21, 2007 and **REPLACE** with the attached "SPECIAL PROVISION, SECTION 308, FULL DEPTH RECYCLING WITH CEMENT", 6 pages dated 11/13/2009.

In the Bid Book (page 93), "SPECIAL PROVISION, SECTION 403, HOT MIX ASPHALT OVERLAY" **CHANGE**, "4" HMA Overlay" to read "**3**" HMA Overlay"
Make this change in pen and ink.



PRINTED ON RECYCLED PAPER

The following questions have been received:

Question: Please Clarify, notes call for placing paving fabric between base layers of pavement, there is only one layer of base pavement. Based on our experience, 1.25" of pavement over fabric is not enough. Please clarify where the paving fabric is to go.

Response: Fabric will be placed on the longitudinal joint on top of the shim and reclaim layer. (Followed by base and surface)

Question: Special Provision 105, note #6 states that all pipes will be insulated before shoulders are excavated. Three of the pipes are noted to be done in the instream work window. This would give the Contractor 48 calendar days to do, 3 pipes, all excavation, gravel, recycle mix, base pave, surface pave, etc. Is that the intent of the Department?

Response: Please see the above pen and ink change.

Question: Please clarify, notes call for both PMRAP and Full Depth Recycled?

Response: Full Depth recycle with cement is the pay item 308. The intent is to utilize the 3" milling material in the shoulders. This operation can be done as a PMRAP process or an in place process, contractors option. (also refer to 202.202 note)

Question: The construction notes call for the recycling with cement, removing pavement surface, and HMA surface to start at station 150+75 and the excavation, gravel and HMA base starting at 154+00, please clarify the Department's intentions. Is there more detail on what is to be done between 150+75 and 154+00?

Response: The beginning of the project is a mill/fill no dirt work. Station 150+75 to 154+00.

Question: According to the Special Provision, Section 403, the 4.75mm shim refers as a 75 gyration mix. Would a 50 gyration mix be allowed? Also the description on Special Provision refers to Bridge Approaches, could the Department clarify?

Response: 50 gyration mix for the 4.75 is acceptable. Bridge approaches if applicable. Please see the above change to Special Provision 403.

Question: On page #2, the triangle on the outside shoulder, is this ASC – Gravel or is this excavation material? If this is Excavation material, then the Subgrade will not drain. If this shoulder is boxed in, does this excavation need to be removed?

Response: This is a box section. During milling operation it is expected the contractor to grade the shoulder to allow for the mill surface to drain. Full depth excavation will be a box.

Question: Specification 308 calls for a sheepsfoot roller for compaction. Is it necessary on a 4" lift of reclaim?

Response: It would be for an in-place operation, but for a layer placed by the paver no.

Question: Who do the excess millings belong to and if it is the Departments, where does it need to be delivered to?

Response: Refer to the updated 308 specification.

Question: Is the Department's intention for removing pavement surface to mill 3" at centerline and carry the cross slope across?

Response: No the intent is to remove 3" across the mat and to pave to cross slope using shim & binder.

Question: General Notes, #15; "All Pavement; the required depth of pavement will be the same as the existing concrete." Explain what this means? Also, what location would this be used at?

Response: Please see the above change to the General Notes.

Consider this change and information prior to submitting your bid on **November 18, 2009.**

Sincerely,

A handwritten signature in dark ink, appearing to read "Scott Bickford". The signature is written in a cursive, somewhat stylized font.

Scott Bickford
Contracts & Specifications Engineer

SPECIAL PROVISION

SECTION 308

(Full Depth Reclamation Pavement with Cement)

Mix Design

The JMF targets represented in this Special Provision are intended to provide a basis for bidding purposes only. The Department will develop a job mix formula for the recycled pavement during the construction of the project.

The Recycled Pavement on this project will be treated with the following material proportions:

Water 3.0 - 6.0 %

Portland Cement 5.0 %

The optimum moisture content for compaction shall be determined by the Department using samples obtained from the recycled stockpiled material by means of AASHTO T 180, Method D.

A contract modification will be executed for cement content if percentages change from the requirements above by more than 0.25 %. Positive and negative price adjustments will be made. The price adjustment will be based upon receipted bills for materials delivered to the project site. If a price adjustment is warranted, the contractor will supply the Department with all the receipted bills for emulsion for the entire project. Adjustments in water content exceeding the initial targets shall not be paid for directly, but shall be incidental.

SPECIAL PROVISION
SECTION 308
FULL DEPTH RECYCLING WITH CEMENT

308.01 Description This work shall consist of utilizing the pavement millings from item 202.202 and creating cement stabilized material to be used as a base material as per the lines, grades, and dimensions shown on the plans or established by the Resident. This shall be done by one of the following methods: 1. Millings will be taken off site and processed to a $\frac{3}{4}$ inch maximum sized material and blended with water and cement in a pug mill. The material will then be placed with a paver and compacted. 2. Millings will be placed and cement spread over the entire area. The material will then be thoroughly mixed by a pulverizer, graded, and compacted.

MATERIALS

308.02 Pavement Millings Pavement millings will come from the project created by item 202.202. The material shall consist of the existing bituminous pavement processed to $\frac{3}{4}$ inch minus if processed in a pug mill. If processed in place by a pulverizer, one inch of the underlying gravel shall pulverized with the pavement millings, cement, and water and blended into a homogenous mass. Pulverized material will be processed to 100% passing a 37.5 mm [1.5 in] square mesh sieve. If additional pavement millings are required, they will be supplied by the Contractor and considered incidental to this item. Any unused pavement milling will become the property of the Contractor.

308.022 Portland Cement The Portland Cement shall be Type I or II meeting the requirements of AASHTO M85.

308.023 Water Water shall be clean and free from deleterious concentrations of acids, alkalis, salts or other organic or chemical substances.

CONSTRUCTION METHOD #1 PUG MILL

310.024 Mixing Plant The mixing plant shall be of sufficient capacity and coordinated to adequately handle the proposed construction. Either a continuous pug mill mixer or a continuous drum type mixing plant shall be used. If a drum mixing plant is used it shall meet the requirements of Section 401.07. The mixing plant shall be capable of producing a uniform mixture meeting the requirements of the job mix formula and accurately meter proposed percentages of each material.

310.025 Hauling Equipment Trucks used for hauling the mixture shall meet the requirements of Section 401.08.

310.026 Bituminous Pavers Pavers shall meet the requirements of Section 401.09. An eight foot paver with a minimum weight of 26,000 pounds will be acceptable for this process.

310.027 Rollers Rollers shall meet the requirements of Section 401.10.

310.028 Mixing The recycled pavement millings blended with cement and water shall be delivered directly to the paver for placement. Recycled pavement millings, cement and water shall be proportioned as per the job mix formula and the mixing time set to produce a mixture in which uniform distribution of all the materials is obtained.

Following mixing, the recycled pavement millings with cement material shall not be stockpiled for more than 2 hours.

CONSTRUCTION METHOD #2 PULVERIZED IN PLACE

308.029 Pulverizer The pulverizer shall be a self-propelled machine, specifically manufactured for full-depth recycling work and capable of reducing the required existing materials to a size that will pass a 37.5 mm [1.5 in] square mesh sieve. The machine shall be equipped with standard automatic depth controls and must maintain a consistent cutting depth and width. The machine also shall be equipped with a gauge to show depth of material being processed.

308.030 Cement Spreader Spreading of the Portland cement shall be done with a spreader truck designed to spread dry particulate (such as Portland Cement or Lime) or other approved means to insure a uniform distribution across the roadway and minimize fugitive dust (See also the *Health and Safety/Right to-Know* section of this Special Provision). **Pneumatic application, including through a slotted pipe, will not be permitted.** Other systems that have been developed include fog systems, vacuum systems, etc. Slurry applications could also be accepted. MaineDOT reserves the right to accept or reject the method of spreading cement based on the concerns specified herein. The Contractor shall provide a method for verifying that the correct amount of cement is being applied.

The cement shall be spread uniformly over the full width of roadway to be recycled just prior to each pass of the stabilizing operation, in a continuous process by means of a mechanical spreader. Dry stabilizing agents shall be spread at the prescribed rate in the job mix formula as provided by the Department. These additives shall then be uniformly blended into a homogeneous mass until an apparent uniform distribution has occurred. The Resident may adjust the rate of application as necessary.

Sufficient water shall be added during the recycling process to meet the moisture requirements as specified.

Health and Safety/Right-to-Know Portland cement is considered a hazardous chemical under US OSHA Hazard Communication Rule 29 CFR 1910.120, therefore, all Contractors and Subcontractors are required to notify their workers of the potential health hazards associated with working with Portland cement. In no area of the work site, where cement or cement-pavement-gravel combination is being applied, re-worked with a pulverizer, rolled or graded, shall respirable dust be allowed to exceed the NIOSH [1974] established respirable dust standard (RDS) recommended exposure limit (REL) of 0.05 mg/m³ (for up to a 10 hour workday during a 40 hour work week). The Contractor shall notify the Resident before commencing any work that involves Portland cement application, reclaiming, rolling, or grading. The Contractor shall designate a Hazardous Waste Operations "Competent Person" to provide direct on-site supervision plus health and safety monitoring for work in the Portland cement impacted sections of the project. The Competent Person shall have certified training and experience in field implementation of the aforementioned regulations.

Submittals The Contractor shall submit a site specific Health and Safety Plan (HASP) to the Resident at least two weeks in advance of any Portland cement related work on the project.

Health and Safety Monitoring In any area of the project where Portland cement is being worked, the Contractor's designated Competent Person shall monitor the worker breathing zone for respirable dust. In the event the OSHA respirable dust REL is exceeded, the Contractor's Competent Person shall direct operations to cease. Operations will not recommence until the situation is corrected and respirable air

returns to acceptable levels. The Contractor shall provide all required health and safety monitoring equipment.

308.031 Grader Placement of the pulverized recycled material to the required slope and grade shall be done with an approved highway grader. The resultant material shall be graded and compacted to the cross-slope and profile shown on the plans or as directed by the Resident. The Contractor will also be responsible for re-establishing the existing profile grade. The completed surface of the full depth recycled course shall be shaped and maintained to a tolerance, above or below the required cross sectional shape, of 12.5 mm [$\frac{1}{2}$ in]. Areas not meeting this tolerance will be repaired as described in Section 308.091.

308.032 Rollers The pulverized recycled material shall be rolled with a vibratory pad/tamping foot roller, a vibratory steel drum soil compactor and a Type II pneumatic tire roller. The pad/tamping foot roller drum shall have a minimum of 112 tamping feet 73 mm [3 in] in height, a minimum contact area per foot of 110 cm² [17 in²], and a minimum width of 2.15 m [84 in]. The vibratory steel drum roller shall have a minimum 2.15 meter [84 in] width single drum. The pneumatic tire roller shall meet the requirements of Section 401.10 and the minimum allowable tire pressure shall be 586 kPa [85 psi].

MIX DESIGN

The Department will supply a mix design for the recycling work based on test results from pavement and soil analysis taken to the design depth. The Department will provide the following information prior to construction:

- 1 Percent of Portland cement to be used – 5% estimated.
- 2 Optimum moisture content for proper compaction – 3 to 6% estimated.
- 3 Additional aggregate (if required) – estimated to not be required.

After a test strip has been completed or as the work progresses, it may be necessary for the Resident to make necessary adjustments to the mix design. Changes to compensation will be in accordance with the Mix Design Special Provision.

CONSTRUCTION REQUIREMENTS AND LIMITATIONS

308.07 Weather Limitations When Portland cement is used, full depth recycled work shall be performed when;

- A. Cement stabilizing operations will be allowed between May 15th and September 15th inclusive in Zone 1 - Areas north of US Route 2 from Gilead to Bangor and north of Route 9 from Bangor to Calais. Cement stabilizing will be allowed between May 1st and September 30th inclusive in Zone 2 - Areas south of Zone 1 including the US Route 2 and Route 9 boundaries.
- B. The atmospheric temperature, as determined by an approved thermometer placed in the shade at the recycling location, is 10°C [50°F] and rising.
- C. When there is no standing water on the surface.
- D. During generally dry conditions, or when weather conditions are such that proper pulverizing, adding, mixing, and curing can be obtained using proper procedures, and when compaction can be accomplished as determined by the Resident.

- E. When the surface is not frozen and when overnight temperatures are expected to be above 0°C [32°F].
- F. Wind conditions as such that the spreading of cement on the roadway ahead of the recycling machine will not adversely affect the operation (cement will not be blown away).

310.043 Compaction Compaction of the mixture shall be in accordance with Section 401.16. Rolling may be delayed to avoid lateral displacement as directed by the Resident.

The recycled material shall be compacted to 98% of the TMD as determined by the test strip. After compaction, the roadway surface shall be treated with a light application of water, and rolled with pneumatic-tired rollers to create a close-knit texture. The finished layer shall be free from:

- A. Surface laminations.
- B. Segregation of fine and coarse aggregate.
- C. Corrugations, centerline differential, potholes, or any other defects that may adversely affect the performance of the layer.

The Contractor shall protect and maintain the recycled layer until a lift of pavement is applied. Frequent light watering shall be performed to keep the finished cement stabilized material moist for at least 72 hours. Any damage or defects in the layer shall be repaired immediately. An even and uniform surface shall be maintained. **The recycled material shall be swept prior to hot mix asphalt placement.**

308.091 Repairs Repairs and maintenance of the recycled layers, during and after the curing period, resulting from damage caused by traffic, weather or environmental conditions, or resulting from damage caused by the Contractor's operations or equipment, shall be completed at no additional cost to the Department.

Low areas will be repaired using a hot mix asphalt shim. Areas up to 25mm [1 in] high can be repaired by milling or shimming with hot mix asphalt. Areas greater than 25mm [1 in] high will be repaired using a hot mix asphalt shim. All repair work will be done with the Resident's approval at the Contractor's expense.

TESTING REQUIREMENTS

308.10 Quality Control The Contractor shall operate in accordance with the approved Quality Control Plan (QCP) to assure a product meeting the contract requirements. The QCP shall meet the requirements of Section 106.4 - Quality Control and this Section. The Contractor shall not begin recycling operations until the Department approves the QCP in writing.

Prior to performing any recycling process, the Department and the Contractor shall hold a Pre-recycle conference to discuss the recycling schedule, type and amount of equipment to be used, sequence of operations, and traffic control. A copy of the QC random numbers to be used on the project shall be provided to the Resident. All field supervisors including the responsible onsite recycling process supervisor shall attend this meeting.

The QCP shall address any items that affect the quality of the Recycling Process including, but not limited to, the following:

- A. JMF(s) including sources for all materials.
- B. Make and type of rollers including weight, weight per inch of steel wheels, and average

contact pressure for pneumatic tired rollers.

- C. Testing Plan.
- D. Recycling operations including recycling speed, yield monitoring, procedures for avoiding recycling and curing in inclement weather, methods to ensure that segregation is minimized, and procedures for mix design modification, grading and compacting operations, and cement application procedure.
- E. Methods for protecting the finished product from damage and procedures for any necessary corrective action.
- F. Method of grade checks.
- G. Examples of Quality Control forms.
- H. Name, responsibilities, and qualifications of the Responsible onsite Recycling Supervisor experienced and knowledgeable with the process.
- I. A note that all testing will be done in accordance with AASHTO and MDOT/ACM procedures. The Project Superintendent shall be named in the QCP, and the responsibilities for successful implementation of the QCP shall be outlined.

The Contractor shall sample, test, and evaluate the full depth reclamation process in accordance with the following minimum frequencies:

MINIMUM QUALITY CONTROL FREQUENCIES

Test or Action	Frequency	Test Method
Density	1 per 300 m [1000 ft] / lane	AASHTO T 310
Air Temperature	4 per day at even intervals	
Surface Temperature	At the beginning and end of each days operation	
Yield of all materials (The daily yield, yield since last test, and total project yield.)	1 per 300 m [1000 ft] / lane	

The Department has the right to view any QC test and to request a QC test at any time. The Contractor shall submit all QC test reports and summaries in writing, signed by the appropriate technician, and present them to the Department's onsite representative by 1:00 P.M. on the next working day, except when otherwise noted in the QCP due to local restrictions. The Contractor shall make all test results, including randomly sampled densities, available to the Department onsite. The Contractor shall cease recycling operations whenever one of the following occurs:

- A. The computed yield differs from the approved Job Mix Formula by 10% or more.
- B. The Contractor fails to follow the approved QCP.
- C. The Contractor fails to achieve 98% density after corrective action has been taken.

308.101 Test Strip The contractor shall assemble all items of equipment for the recycling operation on the first day of the recycling work. The Contractor shall construct a test strip for the project at a location approved by the Resident. The Responsible onsite Recycling Supervisor will work with Department personnel to determine the suitability of the mixed material, cement dispersion within the mixed material, moisture control within the mixed material, and compaction and surface finish. The test strip section is required to:

- A. Demonstrate that the equipment and processes can produce recycled layers to meet the requirements specified in these special provisions.

- B. Determine the effect on the gradation of the recycled material by varying the forward speed of the recycling machine and the rotation rate of the milling drum.
- C. Determine the sequence and manner of rolling necessary to obtain the compaction requirements and establish a target TMD. The Contractor and the Department will calibrate their respective gauges at this time.

The test strip shall be at least 100 m [300 ft] in length of a full lane-width (or a half-road width). Full recycling production will not start until a passing test strip has been accomplished. If a test strip fails to meet the requirements of this specification, the Contractor will be required to repair or replace the test strip to the satisfaction of the Resident. Any repairs, replacement, or duplication of the test strip will be at the Contractor's expense.

Acceptance density testing of the recycled material will be performed by the Department using the nuclear method. After the test strip has been pulverized, the cement added and mixed, and the roadway brought to proper shape, it will be rolled as directed until the nuclear density readings show an increase in dry density of less than 16 kg/m³ [1 pcf] for the final four roller passes. This density will be used as the target TMD for the recycled material. The remaining full depth recycled material shall be compacted to a minimum density of 98% of the target density as determined in the control section.

ACCEPTANCE TEST FREQUENCY

Property	Frequency	Test Method
In-place Density	1 per 600 m [2000 ft] / lane	AASHTO T 310

308.102 Miscellaneous No new pavement shall be placed on the recycled material until a curing period of 72 hours has elapsed. If inclement weather occurs, the Department reserves the right to extend the curing period. **Between 24 and 48 hours after compaction, the finished course shall be vibrated with between 2 and 4 passes of a 11 Mg [12 ton] minimum weight steel-wheel vibratory roller, traveling at a speed of approximately 3.2 kph [2 mph] and vibrating at maximum amplitude (or as directed by Resident). The section shall have 100% coverage exclusive of the outside 300 mm [1 ft] to induce minute cracks in the treated base course. Additional passes may be required to achieve the desired crack pattern or section modulus as directed by the Resident.**

308.103 Method of Measurement: Full Depth Recycled Pavement with Cement will be measured by the square meter [square yard].

308.104 Basis of Payment: The accepted quantity of Full Depth Recycled Asphalt Pavement with Cement will be paid for at the contract unit price per square meter [square yard], complete in-place which price will be full compensation for furnishing all equipment and labor for blending material with a pulverizer or pug mill, placing material, grading material, compacting material, quality control, and for all incidentals necessary to complete the work.

<u>Pay Item</u>	<u>Pay Unit</u>
308.36 Full Depth Recycling With Cement Square	Meter [Square Yard]