

State of Delaware
Department of Transportation

HIGHWAY BITUMINOUS PATCH MATERIAL

Invitation to Bid
Contract No. DOT1203-BITUM_PATCH

JANUARY 11, 2012

- *Deadline to Respond* -
JANUARY 31, 2012
2:00 P.M. local time

STATE OF DELAWARE
Department of Transportation
Contract Administration

CONTRACT NO. DOT1203-BITUM_PATCH

ALL BIDDERS:

The enclosed packet contains an "INVITATION TO BID" for **HIGHWAY BITUMINOUS PATCH MATERIAL**.
The invitation consists of the following documents:

INVITATION TO BID - CONTRACT NO. **DOT1203-BITUM_PATCH**

- 1 DEFINITIONS and GENERAL PROVISIONS
- 2 SPECIAL PROVISIONS
- 3 TECHNICAL SPECIFICATIONS
- 4 BID QUOTATION REPLY SECTION
 - a. Attachment 1 - No Bid Reply Form
 - b. Attachment 2 - Non-Collusion Statement
 - c. Attachment 3 - Sample Monthly Usage Report
 - d. Attachment 4 - Bid Forms
 - e. Attachment 5 - Office of Minority and Women Business Enterprise Information

In order for your bid to be considered, the bid quotation reply section shall be executed completely and correctly and returned in a sealed envelope clearly displaying the contract number, by January 31, 2012, 2:00 p.m. local time

Bids shall be submitted to:

**STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
CONTRACT ADMINISTRATION
800 BAY ROAD
DOVER, DE 19901**

Please review and follow the information and instructions contained in the general and special provisions section of the invitation. Should you need additional information, please contact Contract Administration via e-mail at dot-ask@state.de.us or call 302-760-2031.

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CONTRACT ADMINISTRATION

DEFINITIONS
AND
GENERAL PROVISIONS

The attached Definitions and General Provisions apply to all contracts and are part of each invitation to bid. The requirement to furnish a bid bond and performance bond is applicable unless waived in the Special Provisions. Should the General Provisions conflict with the Special Provisions, the Special Provisions shall prevail. Bidders or their authorized representatives are required to fully acquaint themselves as to State procurement laws and regulations prior to submitting bid.

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DEFINITIONS

Whenever the following terms are used, their intent and meaning shall be interpreted as follows:

STATE: The State of Delaware

AGENCY: Delaware Department of Transportation.

DESIGNATED OFFICIAL: The agent authorized to act for the Agency.

BID INVITATION: The "bid invitation" or "invitation to bid" is a packet of material sent to vendors and consists of General Provisions, Special Provisions, specifications, and enclosures.

GENERAL PROVISIONS: General Provisions are instructions pertaining to contracts in general. They contain, in summary, requirements of laws of the State, policies of the Agency, and instructions to vendors.

SPECIAL PROVISIONS: Special Provisions are specific conditions or requirements peculiar to the contract under consideration and are supplemental to the General Provisions. Should the Special Provisions conflict with the General Provisions, the Special Provisions shall prevail.

BIDDER OR VENDOR: Any individual, firm, or corporation formally submitting a proposal for the material or work contemplated, acting directly or through a duly authorized representative.

PROPOSAL: The offer of the bidder submitted on the approved form and setting forth the bidder's prices for performing the work or supplying the material or equipment described in the specifications.

SURETY: The corporate body which is bound with and for the contract, or which is liable, and which engages to be responsible for the contractor's payments of all debts pertaining to and for its acceptable performance of the work for which it has contracted.

BIDDER'S DEPOSIT: The security designated in the proposal to be furnished by the bidder as a guaranty of good faith to enter into a contract with the Agency if the work to be performed or the material or equipment to be furnished is awarded to the bidder.

CONTRACT: The written agreement covering the furnishing and delivery of material or work to be performed.

CONTRACTOR: Any individual, firm, or corporation with whom a contract is made by the Agency.

CONTRACT BOND: The approved form of security furnished by the contractors and its surety as a guaranty of good faith on the part of the contractor to execute the work in accordance with the terms of the contract.

TON: Weight in English tons equaling 2,000 pounds per ton.

SECTION A - GENERAL PROVISIONS

1. **BID INVITATION:**

See "Definitions".

2. **PROPOSAL FORMS:**

The invitation to bid shall contain pre-printed forms for use by the vendor in submitting its bid. The forms shall contain basic information such as description of the item and the estimated quantities and shall have blank spaces for use by the vendor for entering information such as unit bid price, total bid price, etc.

3. **INTERPRETATION OF ESTIMATES:**

- a. The attention of bidders is called to the fact that, unless stated otherwise, the quantities given in the proposal form are to be considered to be approximate only and are given as a basis for the comparison of bids. The Agency may increase or decrease the amount of any item as may be deemed necessary or expedient, during the period of the contract.
- b. An increase or decrease in the quantity for any item is not sufficient ground for an increase or decrease in the unit price.

4. **SILENCE OF SPECIFICATIONS:**

The apparent silence of the specifications as to any detail, or the apparent omission from it of detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and only material and workmanship of the first quality are to be used. Proof of specifications compliance will be the responsibility of the vendor.

5. **EXAMINATION OF SPECIFICATIONS AND PROVISIONS:**

The bidder shall examine carefully the proposal and the contract forms for the material contemplated. The bidder shall investigate and satisfy itself as to the conditions to be encountered, quality and quantities of the material to be furnished, and the requirements of the Special Provisions and the contract. The submission of a proposal shall be conclusive evidence that the bidder has made examination of the aforementioned conditions.

6. **PREPARATION OF PROPOSAL:**

The bidder's prices **shall be typewritten** on the bid pages provided.

7. **PRICES QUOTED:**

The prices quoted are those for which the material will be furnished F.O.B. Ordering Agency and include all charges that may be imposed during the period of the contract.

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8. **DISCOUNT:**

No qualifying letter or statements in or attached to the proposal, or separate discounts will be considered in determining the low bid except as may be otherwise herein noted. Cash or separate discounts should be computed and incorporated into unit bid price(s).

9. **SAMPLES OR BROCHURES:**

Samples or brochures may be required by the agency for evaluation purposes. They shall be such as to permit the Agency to compare and determine if the item offered complies with the intent of the specifications.

10. **PROPOSAL GUARANTY; BID BOND:**

Waived

11. **DELIVERY OF PROPOSALS:**

Proposals shall be delivered in sealed envelopes, and shall bear on the outside the name and address of the bidder as well as the designation of the contract. Proposals forwarded by U.S. Mail shall be sent first class to the address listed below. Proposals forwarded by delivery service other than the U.S. Mail or hand delivered must be delivered to the address listed below. All bids must clearly display the bid number on the envelope.

Delivery Service:

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
CONTRACT ADMINISTRATION
800 BAY ROAD
DOVER, DE 19901

U.S. Mail:

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
CONTRACT ADMINISTRATION
PO Box 778
DOVER, DE 19903

All proposals will be accepted at the time and place set in the advertisement. Bidder bears the risk of delays in delivery. Proposals received after the time set for public opening will be returned unopened.

12. **WITHDRAWAL OF PROPOSALS:**

A bidder may withdraw its proposal unopened after it has been deposited, if such a request is made prior to the time set for the opening of the proposal.

13. **PUBLIC OPENING OF PROPOSALS:**

The bids shall be publicly opened at the time and place specified by the Agency. Bidders or their authorized representatives are invited to be present.

14. **PUBLIC INSPECTION OF PROPOSALS:**

If the bidder designates a portion of its bid as confidential, it shall isolate and identify in writing the confidential portions. The bidder shall include with this designation a statement that explains and supports the firm's claim that the bid items identified as confidential contain trade secrets or other proprietary data.

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15. **DISQUALIFICATION OF BIDDERS:**

Any one or more of the following causes may be considered as sufficient for the disqualification of a bidder and the rejection of its proposal or proposals:

- a. More than one proposal for the same contract from an individual, firm, or corporation under the same or different names.
- b. Evidence of collusion among bidders.
- c. Unsatisfactory performance record as evidenced by past experience.
- d. If the unit prices are obviously unbalanced either in excess or below reasonable cost analysis values.
- e. If there are any unauthorized additions, interlineation, conditional or alternate bids or irregularities of any kind which may tend to make the proposal incomplete, indefinite, or ambiguous as to its meaning.
- f. Non-attendance of mandatory pre-bid meetings may be cause of disqualification.

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SECTION B - AWARD AND EXECUTION OF CONTRACT

1. **CONSIDERATION OF BIDS:**

- a. After the proposals have been opened, the bids will be tabulated and the results will be made available to the public. Tabulations of the bids will be based on the correct summation of items at the unit price bid.
- b. The right is reserved to waive technicalities, to reject any or all bids, or any portion thereof, to advertise for new proposals, to proceed to do the work otherwise, or to abandon the work, if in the judgment of the Agency or its agent, the best interest of the State will be promoted thereby.

2. **MATERIAL GUARANTY:**

Before any contract is awarded, the successful bidder may be required to furnish a complete statement of the origin, composition and manufacture of any or all of the material to be used in the contract together with such samples as may be requested for the purpose of testing.

3. **CONTRACT AWARD:**

Within thirty days from the date of opening proposals, the contract will be awarded or the proposals rejected.

4. **EXECUTION OF CONTRACT:**

- a. The bidder to whom the award is made shall execute a formal contract and bond within twenty days after date of official notice of the award of the contract.
- b. If the successful bidder fails to execute the required contract and bond, as aforesaid, within twenty days after the date of official notice of the award of the contract, its proposal guaranty shall immediately become forfeited as liquidated damages. Award will then be made to the next lowest qualified bidder of the work or re-advertised, as the Agency may decide.

5. **REQUIREMENT OF CONTRACT BOND:**

Waived

6. **WARRANTY:**

The successful bidder(s) shall be required to extend any policy guarantee usually offered to the general public, FEDERAL, STATE, COUNTY, or MUNICIPAL governments, on material in this contract against defective material, workmanship, and performance.

7. **THE CONTRACT(S):**

The contract(s) with the successful bidder(s) will be executed with the Department of Transportation, Contract Administration section.

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8. **INFORMATION REQUIREMENT:**

The successful bidder's shall be required to advise the Department of Transportation, Contract Administration of the gross amount of purchases made as a result of the contract.

9. **CONTRACT EXTENSION:**

The State reserves the right to extend this contract on a month-to-month basis for a period of up to three months.

10. **TERMINATION FOR CONVENIENCE:**

Contracts shall remain in effect for the time period and quantity specified unless the contract is terminated by the State. The State may terminate the contract at any time by giving written notice of such termination and specifying the effective date thereof, at least sixty (60) days before the effective date of termination.

11. **TERMINATION FOR CAUSE:**

If, for any reasons, or through any cause, the Contractor fails to fulfill in timely and proper manner its obligations under this Contract, or if the Contractor violates any of the covenants, agreements, or stipulations of this Contract, the State shall thereupon have the right to terminate this contract by giving written notice to the Contractor of such termination and specifying the effective date thereof, at least 5 days before the effective date of such termination. In that event, all finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs, and reports or other material prepared by the Contractor under this Contract shall, at the option of the State, become its property, and the Contractor shall be entitled to receive just and equitable compensation for any satisfactory work completed on such documents and other materials which is usable to the State.

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SECTION C - GENERAL

1. **AUTHORITY OF AGENCY:**

On all questions concerning the interpretation of specifications, the acceptability and quality of material furnished and/or work performed, the classification of material, the execution of the work, and the determination of payment due or to become due, the decision of the Agency shall be final and binding.

2. **LAWS TO BE OBSERVED:**

The contractor is presumed to know and shall strictly comply with all National, State, or County laws, and City or Town ordinances and regulations in any manner affecting the conduct of the work. The contractor shall indemnify and save harmless the State of Delaware, the Agency, and all Officers, Agency and Servants thereof against any claim or liability arising from or based upon the violation of any such laws, ordinances, regulations, orders, or decrees whether by itself or by its employees.

3. **PERMITS AND LICENSES:**

All necessary permits, licenses, insurance policies, etc. required by local, State or Federal laws, shall be provided by the contractor at its own expense.

4. **PATENTED DEVICES, MATERIAL AND PROCESSES:**

- a. The contractor shall provide for the use of any patented design, device, material, or process to be used or furnished under this contract by suitable legal agreement with the patentee or owner, and shall file a copy of this agreement with the Agency.
- b. The contractor and the surety shall hold and save harmless the State of Delaware, the Agency, the Director, their Officers or Agents from any and all claims because of the use of such patented design, device, material, or process in connection with the work agreed to be performed under this contract.

5. **EMERGENCY TERMINATION OF CONTRACT:**

- a. Due to restrictions which may be established by the United States Government on material, or work, a contract may be terminated by the cancellation of all or portions of the contract.
- b. In the event the contractor is unable to obtain the material required to complete the items of work included in the contract because of restrictions established by the United States Government and if, in the opinion of the Agency, it is impractical to substitute other available material, or the work cannot be completed within a reasonable time, the incomplete portions of the work may be cancelled, or the contract may be terminated.

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6. **TAX EXEMPTION:**

- a. Material covered by this proposal is exempt from all FEDERAL and STATE TAXES. Such taxes shall not be included in prices quoted.
- b. Any material which is to be incorporated in the work or any equipment required for the work contemplated in the proposal may be consigned to the Agency. If the shipping papers show clearly that any such material is so consigned, the shipment will be exempt from the tax on the transportation of property under provisions of Section 3475 (b) of the Internal Revenue Code, as amended by Public Law 180 (78th Congress). All transportation charges shall be paid by the contractor. Each bidder shall take its exemption into account in calculating its bid for its work.

7. **OR EQUAL (PRODUCTS BY NAME):**

Specifications of products by name are intended to be descriptive of quality or workmanship, finish and performance. Desirable characteristics are not intended to be restrictive. Substitutions of products for those named will be considered provided the vendor certifies that the function, characteristics, performance and endurance qualities of the material offered is equal or superior to that specified.

8. **BID EVALUATION AND AWARD:**

The Department of Transportation, Contract Administration will award this contract to the lowest responsible bidder(s) which in their judgment best serves the interest of the State of Delaware in accordance with Delaware Code Title 29, Section 6923(k). Personnel with experience and technical background may be utilized by the Department of Transportation in making judgment. In case of error in price extension, the unit price(s) shall prevail.

9. **INVOICING:**

After the awards are made, the agencies participating in the bid may forward their purchase orders to the successful bidder(s) in accordance with State Purchasing Procedures. The State will generate a payment voucher upon receipt of an invoice from the vendor.

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SECTION D - EQUAL OPPORTUNITY

1. **EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS:**

During the performance of any contract for public works financed in whole or in part by appropriation of the State of Delaware, the contractor agrees as follows:

- a. The contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, age, or national origin. The contractor will take affirmative action to ensure that applicants are employed and that employees are treated equally during employment without regard to their race, creed, color, sex, age, or national origin. Such action shall include, but not be limited to the following: advertising, lay-off or termination, rates of pay or other forms of compensation, and selection for training including apprenticeships. The contractor agrees to post in conspicuous places, notices to be provided by the contracting agency setting forth the provisions of this non-discrimination clause.
- b. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex, age, or national origin.
- c. The term "contractor for public works" means construction, reconstruction, demolition, alteration, and/or repair work, maintenance work, and paid for in whole or in part out of the funds of a public body except work performed under a vocational rehabilitation program. The manufacture or furnishing of materials, articles, supplies or equipment is not a public work within the meaning of this subsection unless conducted in connection with and at the site of the public work.

Revised 7/1/2009

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CONTRACT NO. DOT1203-BITUM_PATCH
HIGHWAY BITUMINOUS PATCH MATERIAL

SPECIAL PROVISIONS

1. **CONTRACT REQUIREMENTS:**

This contract will be issued to cover the **DOT1203-BITUM_PATCH** requirements.

2. **CONTRACT PERIOD:**

Each vendor's contract shall be valid upon contract execution through January 31, 2013. Each contract may be renewed if agreeable to both parties for up to four (4) additional one year terms through price negotiation between the contractor and the Department of Transportation, Contract Administration. Negotiation should be initiated no later than ninety (90) days prior to the termination of the agreement to allow the Department time to re-advertise this contract if not renewed.

3. **PRICES:**

Prices shall remain firm for each term of the contract, with the exception of the ASPHALT CEMENT COST ADJUSTMENT provision.

4. **PRICE ADJUSTMENT:**

For each succeeding term, the Department of Transportation, Contract Administration shall have the option of accepting new pricing offered by the contractor, or allowing the contract to expire.

5. **SHIPPING TERMS:**

F.O.B. destination freight pre-paid, unless otherwise ordered.

6. **FUNDING OUT:**

The continuation of this contract is contingent upon funding appropriated by the legislature and funds being made available to the Division of Maintenance and Operations for the indicated fiscal year. The purchase order(s) will not be issued prior to the beginning of that fiscal year.

7. **PERFORMANCE BOND REQUIREMENT:**

Performance Bond Waived

8. **MANDATORY INSURANCE REQUIREMENTS:**

Certificate of Insurance and/or copies of insurance policies for the following:

1. As a part of the contract requirements, the contractor must obtain at its own cost and expense and keep in force and effect during the term of this contract, including all extensions, the minimum coverage limits specified below with a carrier satisfactory to the State. All contractors must carry Comprehensive General Liability and at least one of the other coverages depending on the type of service or product being delivered.

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- a. Comprehensive General Liability - \$1,000,000.00 per person/\$3,000,000 per occurrence.
and
 - b. Medical/Professional Liability - \$1,000,000.00 per person/\$3,000,000 per occurrence.
or
 - c. Miscellaneous Errors and Omissions - \$1,000,000.00 per person/\$3,000,000 per occurrence.
or
 - d. Product Liability - \$1,000,000.00 per person/\$3,000,000 per occurrence.
2. Automotive Liability Insurance covering all automotive units used in the work with limits of not less than \$100,000 each person and \$300,000 each accident as to bodily injury and \$25,000 as to property damage to others.
3. Forty-five (45) days written notice of cancellation or material change of any policies is required.

Contract Administrator, dot-ask@state.de.us
Contract No. DOT1203-BITUM_PATCH
State of Delaware
Department Of Transportation
PO Box 778
DOVER, DE 19903
FAX: 302-739-2254

Note: The State of Delaware shall not be named as an additional insured

9. **BASIS OF AWARD:**

The Department of Transportation, Contract Administration shall award this contract to the lowest responsible and responsive bidder(s) of the contract who best meets the terms and conditions of the bid. The award will be made on basis of price and prior history of service and capability.

The Department of Transportation, Contract Administration reserves the right to reject any or all bids in whole or in part, to make multiple awards, partial awards, award by types, item by item, or lump sum total, whichever may be most advantageous to the State of Delaware.

10. **STATE OF DELAWARE BUSINESS LICENSE:**

Prior to receiving an award, the successful vendor shall either furnish the Department of Transportation, Contract Administration with proof of State of Delaware Business Licensure or initiate the process of application where required. An application may be requested in writing to: Division of Revenue, Carvel State Building, P.O. Box 8750, 820 N. French Street, Wilmington, DE 19899 or by telephone to one of the following numbers: (302) 577-8201 - Public Service, (302) 577-8205 - Licensing Department.

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Information regarding the award of this contract will be given to the Division of Revenue. Failure to comply with the State of Delaware licensing requirements may subject your organization to applicable fines and/or interest penalties.

11. **HOLD HARMLESS:**

The successful bidder agrees that it shall indemnify and hold the State of Delaware and all its agencies harmless from and against any and all claims for injury, loss of life, or damage to or loss of use of property caused or alleged to be caused, by acts or omissions of the successful bidder, its employees, and invitees on or about the premises and which arise out of the successful bidder's performance, or failure to perform as specified in the Agreement.

12. **OWNERSHIP OF INTELLECTUAL PROPERTY:**

All copyright and patent rights to all papers, reports, forms, materials, creations, or inventions created or developed in the performance of this contract shall become the sole property of the State of Delaware. On request, the contractor shall promptly provide an acknowledgment or assignment in a tangible form satisfactory to the State to evidence the State's sole ownership of specifically identified intellectual property created or developed in the performance of the contract.

13. **NON-PERFORMANCE:**

In the event the vendor does not fulfill its obligations under the terms and conditions of this contract, the ordering agency may purchase equivalent product on the open market. Any difference in cost between the contract prices herein and the price of open market product shall be the responsibility of the vendor. Under no circumstances shall monies be due the vendor in the event open market products can be obtained below contract cost. Any monies charged to the vendor may be deducted from an open invoice.

14. **FORCE MAJEURE:**

Neither the vendor nor the ordering agency shall be held liable for non-performance under the terms and conditions of this contract due, but not limited to, government restriction, strike, flood, fire, or unforeseen catastrophe beyond either party's control. Each party shall notify the other in writing of any situation that may prevent performance under the terms and conditions of this contract.

15. **CONTRACTOR NON-ENTITLEMENT:**

State of Delaware Contractors for Materiel and for Services shall not have legal entitlement to, nor seek business from another Contractors' Central Contract. Additionally, they shall not utilize other Central Contracts to fulfill the requirements of their respective contract as they are not a "Covered Agency" as defined by Title 29 Chapter 69 of the State Procurement Code.

16. **MANDATORY USAGE REPORT:**

One of the primary goals in administering this contract is to keep accurate records regarding its actual value. This information is essential in order to update the contents of the contract and to establish proper bonding levels if they are required. The integrity of future contracts revolves around our ability to convey accurate and realistic information to all interested bidders.

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A report shall be furnished by the successful contractor **MONTHLY Electronically in Excel format** detailing the purchasing of all items on this contract. The format to be followed is described herein and shall be filed within fifteen (15) days after the end of each reporting period. Any exception to this mandatory requirement may result in cancellation of the award. Failure to provide the report with the minimum required information may also negate any contract extension clauses. Additionally, contractors who are determined to be in default of this mandatory report requirement may have such conduct considered against them, in assessment of responsibility, in the evaluation of future proposals. Vendors not having activity during a specific reporting period, shall reply with a "no activity" if there is no activity during the reporting period.

The report shall be submitted electronically in EXCEL and sent as an attachment to dot-ask@state.de.us. It shall contain the six-digit department and organization code.

17. **ORDERING PROCEDURE:**

Successful contractors are required to have either a local telephone number within the (302) area code, a toll free (800) number, or agree to accept collect calls. Each agency is responsible for placing their orders and may be accomplished by written purchase order, telephone, fax or computer on-line systems. The contractor or vendor must accept full payment by procurement (credit) card and/or conventional check and/or other electronic means at the State's option, without imposing any additional fees, costs or conditions.

18. **BILLING:**

The successful vendor is required to "Bill as Shipped" to the respective ordering agency(s). Ordering agencies shall provide contract number, ship to and bill to address, contact name and phone number.

19. **PAYMENT:**

The agency involved will authorize and process for payment each invoice within thirty (30) days after the date of receipt of a correct invoice. The contractor or vendor must accept full payment by procurement (credit) card and/or conventional check and/or other electronic means at the State's option, without imposing any additional fees, costs or conditions.

20. **PRODUCT SUBSTITUTION:**

All items delivered during the life of the contract shall be of the same type and manufacture as specified or accepted as part of the bid proposal unless specific approval is given by the Department of Transportation, Contract Administration to do otherwise. However, awarded vendors are highly encouraged to offer any like substitute product (s); either generic or brand name, at any time during the subsequent contract term, especially if an opportunity for cost savings to the state exists. In such cases, the state may require the submission of written specifications and/or product samples for evaluation prior to any approvals being granted.

21. **BID/CONTRACT EXECUTION:**

Both the non-collusion statement that is enclosed with this Invitation to Bid and the contract form delivered to the successful bidder for signature **shall** be executed by a representative who has the legal capacity to enter the organization into a formal contract with the State of Delaware, Department of

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Transportation. The awarded vendor(s) will be required to complete the new W-9 Form by visiting the Division of Accounting's Website: <http://accounting.delaware.gov> .

22. **CONTRACTOR RESPONSIBILITY:**

The State will enter into a contract with the successful contractor. The successful contractor shall be responsible for all products and services as required by this ITB. Subcontractors, if any, shall be pre-approved by the agency prior to use.

23. **PERSONNEL:**

- a. The Contractor represents that they have, or will secure at their own expense, all personnel required to perform the services required under this contract.
- b. All of the services required hereunder shall be performed by the Contractor or under its direct supervision, and all personnel, including subcontractors, engaged in the work shall be fully qualified and shall be authorized under State and local law to perform such services.
- c. None of the work or services covered by this contract shall be subcontracted without the prior written approval of the State.

24. **LIFE CYCLE COSTING:**

If applicable, the specifications contained within this ITB have been developed through Life Cycle Cost Analysis that will allow the State to realize the lowest total cost of ownership and operation over the useful life of the equipment.

25. **ENERGY STAR PRODUCTS:**

The contractor **must** provide products that earn the ENERGY STAR rating and meet the ENERGY STAR specifications for energy efficiency. The offeror is encouraged to visit www.energystar.gov for complete product specifications and updated lists of qualifying products.

26. **TERMINATION FOR CONVENIENCE:**

Contracts shall remain in effect for the time period and quantity specified unless the contract is terminated by the State. The State may terminate the contract at any time by giving written notice of such termination and specifying the effective date thereof, at least sixty (60) days before the effective date of termination.

27. **TERMINATION FOR CAUSE:**

If, for any reasons, or through any cause, the Contractor fails to fulfill in timely and proper manner its obligations under this Contract, or if the Contractor violates any of the covenants, agreements, or stipulations of this Contract, the State shall thereupon have the right to terminate this contract by giving written notice to the Contractor of such termination and specifying the effective date thereof, at least 5 days before the effective date of such termination. In that event, all finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs, and reports or other material prepared by the Contractor under this Contract shall, at the option of the State, become its property, and the

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Contractor shall be entitled to receive just and equitable compensation for any satisfactory work completed on such documents and other materials which is usable to the State.

28. **VENDOR EMERGENCY RESPONSE POINT OF CONTACT:**

The awarded vendor(s) shall provide the name(s), telephone, or cell phone number(s) of those individuals who can be contacted twenty four (24) hours a day, seven (7) days a week to meet a critical need for commodities or services when the Governor of the State of Delaware declares a state of emergency under the current Delaware Emergency Operations Plan. Failure to provide this information could render the bid as non-responsive.

29. **CONTRACT USE BY OTHER STATE AGENCIES**

Other state agencies may procure product under this contract so long as the arrangement is agreeable to all parties. (REF: Title 29, Chapter 6914(e) Delaware Code)

30. **SUBSEQUENT NEEDS**

There is the possibility of subsequent need of same or similar products by eligible covered Agencies during the contract period. Such needs will be communicated to the awarded vendor(s) for quotation with all terms and conditions of the contract being applicable.

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**BITUMINOUS PATCH MATERIAL
CONTRACT NO. DOT1203-BITUM_PATCH**

By reference, the following specifications are incorporated herein:

Department of Transportation, "Standard Specifications for Road and Bridge Construction, dated August 2001", as amended on the advertisement date of this contract.

The attached clauses relate in particular to furnishing of material and represent modifications to and/or clarification of the specifications noted above.

In case of conflict, these Special Provisions shall take precedence and shall govern.

BIDDING PROCEDURES. The Department will accept bids on Contract No., DOT1203-BITUM_PATCH encompassing the following Sections:

- Section A - North and Canal District
- Section B - Central District
- Section C - South District

Bidders may bid on any one or all Sections. However, bidders must bid on all items in whichever Section they bid.

DESCRIPTION OF PROJECT. The contractor is advised that this contract is considered a supply contract. The quantities in the proposal are based on estimated needs.

Notice is hereby provided that the Department may increase or decrease the quantities purchased as deemed necessary or expedient. An increase or decrease in the quantity will not be regarded as grounds for an increase or decrease in the unit prices.

SCOPE. The contractor shall supply materials listed within the contract and other like material approved by the Engineer to the designated delivery location(s).

EXEMPT FROM TAXES. Articles covered by these proposals are exempt of all FEDERAL and STATE taxes. Such taxes shall not be included in prices quoted. Successful bidders(s) will be required to furnish necessary or applicable tax exemption forms with their invoices.

PRICES QUOTED. The prices quoted are that for which the material will be furnished F.O.B. contractor's production facility, or point(s) of delivery as indicated and shall include all charges that may be imposed during the life of the contract(s).

PRODUCTION PLANT LIMITATIONS. The following locations shall be allowed for use under this contract:

Section A – North and Canal District

The production plant shall be located within a 25-mile radius of the Maintenance Facility at the Chesapeake and Delaware Canal.

Section B - Central District

The production plant shall be located within a 25-mile radius of Central District's Dover Facility.

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Section C - South District

Area I –The production plant shall be located within a 25-mile radius of the Dagsboro Maintenance Facility.

Area II –The production plant shall be located within a 25-mile radius of the Ellendale Maintenance Facility.

DELIVERY PROVISIONS (TIME IS OF THE ESSENCE). Time is of the essence for delivery and/or supply by the contractor. Delivery and/or supply must be made within 24 hours after receipt of either written or electronic mail notification. Delivery and/or supply shall be made during the time specified at order. If the material is not delivered and/or supplied in the time allotted, or the specified minimum delivery and/or supplied rate is not met, the Engineer reserves the right to purchase the needed material on the open market to meet their needs. Costs of open market purchases in excess of those, which would have resulted from contract purchases, will be back charged to the contractor. Failure to deliver and/or supply the full order of material by the delivery and/or supply deadline constitutes default on the part of the Contractor.

VERIFICATION OF DELIVERED WEIGHT. The Department may require the delivering vehicle be weighed at a local scale for any delivery location on an occasional basis. Any cost for the scale will be paid by the Department if the weights are comparable to the shipper's tendered weight. The Department shall not give the contractor prior notice of its intent to weigh. This is done to spot-check the accuracy of shipper weights. For deliveries that are weighed, the local scale weight shall be used as the billing weight if the local scale is certified. If incorrect tendered weights are discovered, the Department may require a meeting with the contractor to discuss how the problem will be addressed by the contractor. If the Department is not satisfied with the contractor's response, the Department has the right to cancel the contract as per section B.11 of this agreement.

QUALITY AND SERVICE. Samples of the materials furnished on this contract will be tested by the Materials and Research Section and/or certified analysis shall be furnished by the manufacturer.

Upon award of this contract, the contractor shall promptly notify the Engineer of their proposed sources of materials and make any other related product submissions. This information shall be sent electronically to the Assistant Materials Engineer, Greg Hainsworth (gregory.hainsworth@state.de.us) with a courtesy copy to Tammy Shahan (tammy.shahan@state.de.us).

The Materials and Research Engineer or their representative may take samples from any shipments received for analysis. The results of such tests shall be final and binding upon all parties concerned in these contracts and subject to the conditions contained herein.

If the vendor is required to deliver, the material, it shall be delivered to the location(s) designated and unloaded as directed by the Engineer.

REJECTION OF MATERIAL. If material specifications are not met, the Engineer has the right to accept the material at a pro-rated payment. The method for determining payment will be based upon the review of the test results and determining the amount of variance of the material in question. Material rejected by the Department that cannot be used due to its specification shall be removed from the Department's property by the contractor immediately. If the rejected material contaminated other material, said material shall also be removed immediately by the contractor. Contractor is liable for all costs incurred by the Department in dealing with the issue, including lost material, freight, lab fees, new procedures to avoid recurrence, etc. The Department has the option to accept an agreed upon settlement it determines is in the best interest of the Department. If the Department is not satisfied with the contractors handling of the rejected material, the Department may declare the contractor in default of the contract, cancelling the contract and jeopardizing the contractors ability to bid contracts with the Department.

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REGULATORY CHANGES. It is distinctly understood by and between the parties hereto that in the event any U.S. Government code or state government codes affecting these contracts, now in existence or comes into existence during the lifetime of these contracts and becomes operative, that all said parties herein shall adhere to the regulations contained in said code or codes and the failure to do so shall be a breach of contract by the party failing to comply as above.

PAYMENT. The Contractor shall submit their vendor identification number and shall be required to have established their W-9 with the Division of Accounting prior to contract execution.

Payment for the material will be made upon presentation of triplicate billing certified to the Engineer and acceptance of the material furnished, and mailed as follows:

Department of Transportation
Maintenance & Operations, North District
9 East Regal Blvd.
Newark, DE 19713
Attn. Heidi Oxley, (302) 894-6305

Department of Transportation
Maintenance & Operations, Canal District
250 Bear-Christiana Road
Bear, DE 19701
Attn. Debbie Cox, (302) 326-4414

Department of Transportation
Maintenance & Operations, Central District
930 Public Safety Boulevard
Dover, DE 19901
Attn. Lanie Thornton, (302) 760-2425

Department of Transportation
Maintenance & Operations, South District
P. O. Box 490
Georgetown, DE 19947
Attn. Lisa Rollison, (302) 853-1321

STATE OF DELAWARE
Department of Transportation
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HIGHWAY BITUMINOUS PATCH MATERIAL
Contract No. DOT1203-BITUM_PATCH

SPECIFICATIONS

DESCRIPTION. The materials used for this work can be either Superpave items or Warm Mix Asphalt Superpave items.

MATERIALS. The materials used for this item shall meet the applicable specifications for either Superpave or Warm Mix Asphalt per DeIDOT specifications. All applicable specifications shall govern for the Patching items listed below (materials only):

401665 - SUPERPAVE, TYPE C HOT-MIX, 160 GYRATIONS, PG 64-22, PATCHING

401666 - SUPERPAVE, TYPE B HOT-MIX, 160 GYRATIONS, PG 64-22, PATCHING

401821 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22, PATCHING

401822 - WMA, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 64-22, PATCHING

METHOD OF MEASUREMENT. The quantity of material to be paid for shall be the number of units of material conforming with all the requirements, furnished in accordance with these provisions.

Where applicable, weights will only be accepted as showing the actual amount of material delivered if verified by certified and stamped weight slips signed by a certified weigh master.

BASIS OF PAYMENT. The material will be paid for at the unit prices as contained in the contract, which price and payment shall constitute full compensation for furnishing the materials in accordance with these provisions.

401665 - SUPERPAVE, TYPE C HOT-MIX, 160 GYRATIONS, PG 64-22, PATCHING
401666 - SUPERPAVE, TYPE B HOT-MIX, 160 GYRATIONS, PG 64-22, PATCHING

Description:

The following Subsections of the Standard Specifications shall be applicable: 401.01, 401.03 - 401.10, 401.12, and 401.13. All other subsections have been modified herein.

The Contractor shall read and thoroughly understand the requirements of the QA/QC specification as defined in item 401699. It is the responsibility of the Contractor to determine all costs associated with meeting these requirements and to include them in the per ton bids for the various Superpave bituminous concrete items. The Contractor shall also be aware that the pay adjustment factors in item 401699 will be applied to the Superpave bituminous concrete payments to determine the bonus or penalty for the item.

Materials:

Materials for hot-mix, hot-laid bituminous concrete shall conform to the requirements of Subsections 823.01, 823.05- 823.17, and 823.25 - 823.28 of the Standard Specifications and the following.

Asphalt Binder:

The asphalt binder shall meet the requirements of Superpave PG 64-22, PG 70-22, or PG 76-22 performance grade asphalt, as referenced in the Plans, according to M-320, Table 1 and tested according to AASHTO PP6 with the following test ranges:

TEST PROCEDURE	AASHTO REFERENCE	SPECIFICATION LIMITS
Temperature, C	M-320	Per Grade
Original DSR, G*/sin (δ)	T-315	1.00 - 2.00 kPa
RTFO DSR, G*/sin (δ)	T-315	2.20 - 5.00 kPa
PAV DSR, G*/sin (δ)	T-315	1400 - 5000 kPa
BBR Creep Stiffness	T-313	90.0 - 300.0 kPa
BBR — value	T-313	0.300 - 0.440

Substitution of a higher temperature grade will require prior approval by the Engineer.

Recycled Materials:

The percentage allowance of recycled materials (recycled asphalt pavement and/or shingles) shall be controlled through the use of the Materials & Research recycled mixture program available through the Materials & Research Section. The program can be used by the Contractor to determine which materials and combinations of materials can be used to meet the specified material on the contract.

If the Contractor proposes to use a combination of materials that are not covered by this program, the mix design shall be submitted and reviewed by the Engineer.

Shingles:

Only shingles reclaimed from shingle manufacturers such as tabs, punch-outs, and damaged new shingles shall be allowed in the mixture. Post-consumer shingles or used shingles shall not be permitted in the mixture and all shingles shall be free of all foreign material and moisture. Fiberglass-backed and organic felt-backed shingles shall be kept separately and both materials shall not be used in the same mixture at the same time. The shingles shall be broken down in the mixing process with 100% passing the ½ in (12.5 mm) sieve. Shipping, handling, and shredding costs are incidental to the price of Superpave item.

Mineral Aggregate:

The mineral aggregate employed in the target gradation of the job mix formula (JMF) shall conform to Section 805 and the following criteria. These criteria apply to the combined aggregate blend.

DESIGN ESAL'S (MILLIONS)	COARSE AGGREGATE ANGULARITY ¹ (% MIN)		FINE AGGREGATE ANGULARITY ² (% MIN)		CLAY CONTENT ³ (% - MIN)	FLAT AND ELONGATED ⁴ (% - MAX)
	≤ 100 MM	> 100 MM	≤ 100 MM	> 100 MM		
< 0.3	55/-	-/-	-	-	40	-
0.3 to < 3	75/-	50/-	40	40	40	10
3 to <10	85/80 ⁵	60/-	45	40	45	
10 < 30	95/90	80/75	45	40	45	
30	100/100	100/100	45	45	50	

¹Coarse Aggregate Angularity is tested according to ASTM D5821.

²Fine Aggregate Angularity is tested according to AASHTO TP-33.

³Clay Content is tested according to AASHTO T176.

⁴Flat and Elongated is tested according to ASTM 4791 with a 5:1 aspect ratio.

⁵ 85/80 denotes that 85% of the coarse aggregate has one fractured face and 80% has two or more fractured faces.

The following source properties apply to the individual aggregates in the aggregate blend for the proposed JMF.

TEST METHOD	SPECIFICATION LIMITS
Toughness , AASHTO T96 Percent Loss, Maximum	40
Soundness , AASHTO T104 Percent Loss, Maximum for five cycles	20
Deleterious Materials , AASHTO T112 Percent, Maximum	10
Moisture Sensitivity , AASHTO T283 Percent, Minimum	80

For any roadway with a minimum average daily traffic volume (ADT) of 8000 vehicles and a posted speed of 35 mph (60 kph) or greater, the polish value of the composite aggregate blend shall be greater than 8.0 when tested according to Maryland State Highway Administration MSMT 411 – “Laboratory Method of Predicting Frictional Resistance of Polished Aggregates and Pavement Surfaces.” RAP shall be assigned a value of 4.0. The Contractor shall supply all polish values to the Engineer upon request.

Mineral Filler:

The mineral filler shall conform to AASHTO M17.

Mixture Requirements:

Mix Design. Develop and submit a job mix formula for each mixture according to AASHTO R35. Each mix design shall be capable of being produced, placed, and compacted as specified.

Gradation: The FHWA Superpave 0.45 Power Chart with the recommended restricted zone shall be used to define permissible gradations for the specified mixture. Type C shall be either a No.4 (4.75 mm), 3/8” (9.5 mm), or 1/2” (12.5 mm) Nominal Maximum Aggregate Size Hot-Mix. Unless otherwise noted in the Plans, the Type C shall meet the 3/8” (9.5 mm) Nominal Maximum Aggregate Size. Type B Hot-Mix shall be the 3/4” (19.0 mm) Nominal Maximum Aggregate Size and the Bituminous Concrete Base Course (BCBC) shall be the 1” (25.0 mm) Nominal Maximum Aggregate Size. Target values for percent passing each standard sieve for the design aggregate structure shall comply with the Superpave control points and should avoid the restricted zone. Percentages shall be based on the washed gradation of the aggregate according to AASHTO T11.

In addition to the results of the material requirements specified above, the following material properties shall be provided by the contractor: bulk specific gravity G_{sb} , apparent specific gravity G_{sa} , and the absorption of the individual aggregate stockpiles to be used, tested according to AASHTO T84 and AASHTO T85 and reported to three decimal places along with the specific gravity of the mineral filler to be used, tested according to AASHTO T100 and reported to three decimal places.

Superpave Gyrotory Compactive (SGC) Effort:

The Superpave Gyrotory Compaction effort employed throughout mixture design, field quality control, or field quality assurance shall be as indicated below. All mixture specimens tested in the SGC shall be compacted to N_M . Height data provided by the SGC shall be employed to calculate volumetric properties at N_I , N_D , and N_M .

Superpave Gyrotory Compactive (SGC) Effort:

DESIGN TRAFFIC LEVEL (MILLION ESAL'S)	$N_{INITIAL}$	N_{DESIGN}	$N_{MAXIMUM}$
0.3 to < 3	7	75	115
3 to < 30	8	100	160
30	9	125	205

Volumetric Design Parameters. The design aggregate structure at the target asphalt cement content shall satisfy the volumetric criteria below:

DESIGN ESAL'S (MILLION)	REQUIRED DENSITY (% OF THEORETICAL MAXIMUM SPECIFIC GRAVITY)			VOIDS-IN-MINERAL AGGREGATE (% - MINIMUM) NOMINAL MAX. AGGREGATE (MM)					VOIDS FILLED WITH ASPHALT (% - MINIMUM)
	$N_{INITIAL}$	N_{DESIGN}	N_{MAX}	25.0	19.0	9.5	12.5	4.75	
0.3 to < 3	≤ 90.5								65.0 - 78.0
3 to < 10	89.0	96.0	98.0	12.5	13.5	15.5	14.5	16.5	65.0 - 75.0 ¹
10 < 30									
30									

Air voids (V_a) at N_{design} shall be 4.0% for all ESAL designs. Air voids (V_a) at N_{max} shall be a minimum of 2.0% for all ESAL designs

The dust to binder ratio for the mix having aggregate gradations above the Primary Control Sieve (PCS) Control Points shall be 0.6-1.2. For aggregate gradations below the PCS Control Points, the dust to binder ratio shall be 0.8-1.6. For the No. 4 (4.75 mm) mix, the dust to binder ratio shall be 0.9-2.0 whether above or below the PCS Control Points.

For 3/8" (9.5 mm) Nominal Maximum Aggregate Size mixtures, the specified VFA range shall be 73.0% to 76.0% and for 4.75 mm Nominal Maximum Size mixtures, the range shall be 75 % to 78% for design traffic levels > 3 million ESALs.

Gradation Control Points:

The combined aggregates shall conform to the gradation requirement specified in the following table when tested according to T-11 and T-27.

Nominal Maximum Aggregates Size Control Points, Percent Passing										
SIEVE SIZE	25.0 MM		19.0 MM		12.5 MM		9.5 MM		4.75 MM	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
37.5 MM	100	-	-	-	-	-	-	-	-	-
25.0 MM	90	100	100	-	-	-	-	-	-	-
19.0 MM	-	90	90	100	100	-	-	-	-	-
12.5 MM	-	-	-	90	90	100	100	-	100	-
9.5 MM	-	-	-	-	-	90	90	100	95	100
4.75 MM	-	-	-	-	-	-	-	90	90	100
2.36 MM	19	45	23	49	28	58	32	67	-	-
1.18 MM	-	-	-	-	-	-	-	-	30	60
0.075 MM	1	7	2	8	2	10	2	10	6	12

Note: The aggregate's gradation for each sieve must fall within the minimum and maximum limits.

Gradation Classification:

The Primary Control Sieve (PCS) defines the break point of fine and coarse mixtures. The combined aggregates shall be classified as coarse graded when it passes below the Primary Control Sieve (PCS) control point as defined below. All other gradations shall be classified as fine graded.

PCS CONTROL POINT FOR MIXTURE NOMINAL MAXIMUM AGGREGATES SIZE (% PASSING)					
Nominal maximum Aggregates Size	25.0 mm	19.0 mm	12.5 mm	9.5 mm	4.5 mm
Primary Control Sieve	4.75 mm	4.75 mm	2.36 mm	2.36 mm	1.18 mm
PCS Control Point	40	47	39	47	30-60

Plant Production Tolerances:

Volumetric Property	Superpave Criteria
Air Voids (V_a) at (%) N_m Air Voids (V_a) at N_{design} (%)	2.0 (min) 5.5 (max)
Voids in Mineral Aggregate (VMA) at N_{design} 25.0 mm Bituminous Concrete Base Course 19.0 mm Type B Hot-Mix 12.5 mm Type C Hot-Mix 9.5 mm Type C Hot-Mix 4.5 mm Type C Hot-Mix	-1.2 +2.0

Design Evaluation:

The contractor shall furnish a Job Mix Formula (JMF) for review and approval. The Engineer may elect to evaluate the proposed JMF and suitability of all materials. All materials requested by the Engineer shall be provided at the contractor's expense to the Central Laboratory in Dover in a timely manner upon request. To verify the complete mixture design and evaluate the suitability of all materials, the following approximate quantities are required:

- 5.25 gal (20 liters) of the asphalt binder;
- 0.13 gal (0.5 liters) sample of liquid heat-stable anti-strip additive;
- 254 lb. (115 kg) of each coarse aggregate;
- 154 lb. (70 kg) of each intermediate and fine aggregate;
- 22 lb. (10 kg) of mineral filler; and
- 254 lb. (115 kg) of RAP, when applicable.

The proposed JMF shall include the following:

Plot of the design aggregate structure on the FHWA Superpave 0.45 power chart showing the maximum density line, Superpave control points, and recommended restricted zone.

Plot of the three trial asphalt binder contents at +/- 0.5% gyratory compaction curves where the percent of maximum specific gravity (% of G_{mm}) is plotted against the log base ten of the number of gyrations ($\log(N)$) showing the applicable criteria for N_i , N_d , and N_m .

Plot of the percent asphalt binder by total weight of the mix (P_b) versus the following:

% of G_{mm} at N_d , VMA at N_d , VFA at N_d , Fines to effective asphalt binder (P_{be}) ratio, and unit weight (kg/m^2) at both N_d and N_m .

Summary of the consensus property standards test results for the design aggregate structure, summary of the source property standards test results for the individual aggregates in the design aggregate structure, target value of the asphalt binder content, and a table of G_{mm} of the asphalt mixture for the four trial asphalt binder contents determined according to AASHTO T209.

The JMF shall also include the NCAT Ignition Oven calibration for the specific materials utilized for this mix.

Construction.

Weather Limitations. Place mix only on dry, unfrozen surfaces and only when weather conditions allow for proper production, placement, handling, and compacting.

Compaction:

Compaction shall be tested and paid per Item 401699 - Quality Control/Quality Assurance of Bituminous Concrete .05 (b) Pavement Construction - Tests and Evaluations.

Method of Measurement and Basis of Payment:

Method of Measurement and Basis of Payment will be in accordance with Subsections 401.14 and 401.15 of the Standard Specifications.

The item 401699, will define adjustment factor to be applied to the bituminous concrete payments for bonus or penalty.

1/06/2010

401821 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22, PATCHING
401822 - WMA, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 64-22, PATCHING

Description:

Warm mix asphalt (WMA) is the generic term used to describe the reduction in production, paving, and compaction temperatures achieved through the application of one or more WMA technologies.

WMA may be produced by one or a combination of several technologies involving asphalt foaming processes and equipment or additives that facilitate the reduction of the temperature at which the mix can be placed and satisfactorily compacted thereby permitting the mix to be produced at reduced temperatures from a comparable mix without the Warm Mix Technology.

The following Subsections of the Standard Specifications shall be applicable: 401.01, 401.03 - 401.10, 401.12, and 401.13. All other subsections have been modified herein.

The Contractor shall read and thoroughly understand the requirements of the QA/QC specification as defined in item 401699. It is the responsibility of the Contractor to determine all costs associated with meeting these requirements and to include them in the per ton bids for the various Superpave bituminous concrete items. The Contractor shall also be aware that the pay adjustment factors in item 401699 will be applied to the Superpave item payments to determine the bonus or penalty for the item.

Materials:

If the Contractor proposes to use a combination of materials that are not covered by this Specification, the mix design shall be submitted and reviewed by the Engineer 30 calendar days prior to use.

Conform to the requirements of Subsections 823.01, 823.05- 823.17, and 823.25 - 823.28 of the Standard Specifications and the following for bituminous materials:

Asphalt Binder:

The asphalt binder shall meet the requirements of Superpave performance-grade asphalt binder, as referenced in the Plans, according to M 320¹, Table 1 and tested according to AASHTO R29 with the following test ranges:

TEST PROCEDURE	AASHTO REFERENCE	SPECIFICATION LIMITS
Temperature, °C	M 320	Per Grade
Original DSR, $G^*/\sin(\delta)$	T 315	1.00 - 2.20 kPa
RTFO DSR, $G^*/\sin(\delta)$	T 315	≥ 2.20 kPa
PAV DSR, $G^* \sin(\delta)$	T 315	≤ 5000 kPa
BBR Creep Stiffness, S	T 313	≤ 300.0 kPa
BBR m -value	T 313	≥ 0.300

Note 1: The exception to M 320 is that the original DSR shall be 1.00 to 2.20 kPa

Substitution of a higher temperature grade will require prior approval by the Engineer.

The highest low temperature grade virgin binder to be used is -22.

Depending on the level of RAP used, the low temperature properties, per T 313, may be different than stated in M 320 or the previous table.

Recycled Materials:

The percentage allowance of recycled asphalt pavement shall be controlled through the use of the Materials & Research recycled mixture program available through the Materials & Research Section. The program can be used by the Contractor to determine which materials and combinations of materials can be used to meet the specified material on the contract.

No recycled asphalt shingles shall be used in WMA.

Mineral Aggregate:

Conform to Section 805 and the following criteria. These criteria apply to the combined aggregate blend.

DESIGN ESAL'S (MILLIONS)	COARSE AGGREGATE ANGULARITY ¹ (% MIN)		FINE AGGREGATE ANGULARITY ² (% MIN)		CLAY CONTENT ³ (% - MIN)	FLAT AND ELONGATED ⁴ (% - MAX)
	≤ 100 mm	> 100 mm	≤ 100 mm	> 100 mm		
< 0.3	55/-	-/-	-	-	40	-
0.3 to < 3	75/-	50/-	40	40	40	10
3 to <10	85/80 ⁵	60/-	45	40	45	
10 < 30	95/90	80/75	45	40	45	
30	100/100	100/100	45	45	50	

¹Coarse Aggregate Angularity is tested according to D5821.

²Fine Aggregate Angularity is tested according to TP33.

³Clay Content is tested according to T176.

⁴Flat and Elongated is tested according to D4791 with a 5:1 aspect ratio.

⁵ 85/80 denotes that 85% of the coarse aggregate has one fractured face and 80% has two or more fractured faces.

The following source properties apply to the individual aggregates in the aggregate blend for the proposed JMF.

TEST METHOD	SPECIFICATION LIMITS
Toughness, T96 Percent Loss, Maximum	40
Soundness, T104 Percent Loss, Maximum for five cycles	20
Deleterious Materials, T112 Percent, Maximum	10
Moisture Sensitivity, T283 Percent, Minimum	80

Supply all polish values to the Engineer upon request. The polish value of the composite aggregate blend for any roadway with a minimum average daily traffic volume (ADT) of 8000 vehicles and a posted speed of 35 mph (60 kph) or greater shall be greater than 8.0 when tested according to Maryland State Highway Administration 'MSMT 411 - Laboratory Method of Predicting Frictional Resistance of Polished Aggregates and Pavement Surfaces'. RAP shall be assigned a value of 4.0.

Mineral Filler:

Conform to M17.

Warm Mix Additives:

For any WMA technology requiring addition of any material by the producer during production, the following information will be submitted with the proposed JMF for review and approval at least 30 calendar days prior to production:

1. WMA technology and/or additive information.
2. WMA technology manufacturer's recommendation for usage.
3. WMA technology target dosage rate and tolerance envelope. Support tolerance envelope with test data demonstrating acceptable mix production properties conforming to all sections of this specification.
4. WMA technology manufacturer's material safety data sheets (MSDS).
5. Documentation of past WMA technology field application including points of contact.
6. Temperature ranges for mixing and compacting.
7. Laboratory test data, samples, and sources of all mix components, and asphalt binder viscosity-temperature relationships.

The contractor shall follow the manufacturer's recommendation for incorporating additives and WMA technologies into the mix. The contractor shall also comply with the manufacturer's recommendation regarding receiving, storage, and delivery of additives.

If the producer performs blending of the WMA technology in their tank, a separate Quality Control plan shall be submitted by the producer to the Department for review and approval at least 30 calendar days prior to production.

Mixture Requirements:

Mix Design. Develop and submit a job mix formula for each mixture according to R35. Each mix design shall be capable of being produced, placed, and compacted as specified. Apply all mix design requirements for Superpave to the development of the WMA mix design.

Gradation: The FHWA Superpave 0.45 Power Chart shall be used to define permissible gradations for the specified mixture. Type C shall be either a No.4 (4.75 mm), 3/8" (9.5 mm), or 1/2" (12.5 mm) Nominal Maximum Aggregate Size Hot-Mix. Unless otherwise noted in the Plans, the Type C shall meet the 3/8" (9.5 mm) Nominal Maximum Aggregate Size. Type B Hot-Mix shall be the 3/4" (19.0 mm) Nominal Maximum Aggregate Size and the Bituminous Concrete Base Course (BCBC) shall be the 1" (25.0 mm) Nominal Maximum Aggregate Size. Target values for percent passing each standard sieve for the design aggregate structure shall comply with the Superpave control points and should avoid the restricted zone. Percentages shall be based on the washed gradation of the aggregate according to T11.

Thin WMA, Type C shall be a No. 4 (4.75 mm) Nominal Maximum Aggregate Size Only.

In addition to the results of the material requirements specified above, the following material properties shall be provided by the Contractor: bulk specific gravity G_{sb} , apparent specific gravity G_{sa} , and the absorption of the individual aggregate stockpiles to be used, tested according to T84 and T85 and reported to three decimal places along with the specific gravity of the mineral filler to be used, tested according to T100 and reported to three decimal places.

Superpave Gyratory Compactive (SGC) Effort:

The Superpave Gyratory Compaction effort employed throughout mixture design, field quality control, or field quality assurance shall be as indicated below. All mixture specimens tested in the SGC shall be compacted to N_{MAX} . Height data provided by the SGC shall be employed to calculate volumetric properties at $N_{INITIAL}$, N_{DESIGN} , and N_{MAX} .

Superpave Gyratory Compactive (SGC) Effort:

DESIGN TRAFFIC LEVEL (MILLION ESAL'S)	$N_{INITIAL}$	N_{DESIGN}	N_{MAX}
0.3 to < 3	7	75	115
3 to < 30	8	100	160
30	9	125	205

Volumetric Design Parameters. The design aggregate structure at the target asphalt cement content shall satisfy the volumetric criteria below:

DESIGN ESAL'S (MILLION)	REQUIRED DENSITY (% OF THEORETICAL MAXIMUM SPECIFIC GRAVITY)			VOIDS-IN-MINERAL AGGREGATE (% - MINIMUM) NOMINAL MAX. AGGREGATE (mm)					VOIDS FILLED WITH ASPHALT (% - MINIMUM)
	$N_{INITIAL}$	N_{DESIGN}	N_{MAX}	25.0	19.0	9.5	12.5	4.75	
0.3 to < 3	≥90.5								65.0 - 78.0
3 to < 10		96.0	≤ 98.0	12.5	13.5	15.5	14.5	16.5	65.0 - 75.0 ¹
10 < 30									
30	89.0								

Air voids (V_a) at N_{design} shall be 4.0% for all ESAL designs. Air voids (V_a) at N_{max} shall be a minimum of 2.0% for all ESAL designs

The dust to effective binder ratio for the mix having aggregate gradations above the Primary Control Sieve (PCS) Control Points shall be 0.6-1.2. For aggregate gradations below the PCS Control Points, the dust to binder ratio shall be 0.8-1.6. For the No. 4 (4.75 mm) mix, the dust to binder ratio shall be 0.9-2.0 whether above or below the PCS Control Points.

For 3/8" (9.5 mm) Nominal Maximum Aggregate Size mixtures, the specified VFA range shall be 73.0% to 76.0% and for 4.75 mm Nominal Maximum Size mixtures, the range shall be 75 % to 78% for design traffic levels 3 million ESALs.

Gradation Control Points:

The combined aggregates shall conform to the gradation requirement specified in the following table when tested according to T11 and T27.

Nominal Maximum Aggregates Size Control Points, Percent Passing										
	25.0 mm		19.0 mm		12.5 mm		9.5 mm		4.75 mm	
SIEVE SIZE	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
37.5 mm	100	-	-	-	-	-	-	-	-	-
25.0 mm	90	100	100	-	-	-	-	-	-	-
19.0 mm	-	90	90	100	100	-	-	-	-	-
12.5 mm	-	-	-	90	90	100	100	-	100	-
9.5 mm	-	-	-	-	-	90	90	100	95	100
4.75 mm	-	-	-	-	-	-	-	90	90	100
2.36 mm	19	45	23	49	28	58	32	67	-	-
1.18 mm	-	-	-	-	-	-	-	-	30	60
0.075 mm	1	7	2	8	2	10	2	10	6	12

Note: The aggregate gradation for each sieve must fall within the minimum and maximum limits.

Gradation Classification:

The Primary Control Sieve (PCS) defines the break point of fine and coarse mixtures. The combined aggregates shall be classified as coarse graded when it passes below the Primary Control Sieve (PCS) control point as defined below. All other gradations shall be classified as fine graded.

PCS CONTROL POINT FOR MIXTURE NOMINAL MAXIMUM AGGREGATES SIZE (% PASSING)					
Nominal maximum Aggregates Size	25.0 mm	19.0 mm	12.5 mm	9.5 mm	4.5 mm
Primary Control Sieve	4.75 mm	4.75 mm	2.36 mm	2.36 mm	1.18 mm
PCS Control Point	40	47	39	47	30-60

Plant Production Tolerances:

Volumetric Property	Superpave Criteria
Air Voids (V_a) at (%) N_{max}	2.0 (min)
Air Voids (V_a) at N_{design} (%)	5.5 (max)
Voids in Mineral Aggregate (VMA) at N_{design}	
25.0 mm Bituminous Concrete Base Course	-1.2
19.0 mm Type B Hot-Mix	+2.0
12.5 mm Type C Hot-Mix	
9.5 mm Type C Hot-Mix	
4.5 mm Type C Hot-Mix	

Design Evaluation:

The contractor shall furnish a Job Mix Formula (JMF) for review and approval. The Engineer may elect to evaluate the proposed JMF and suitability of all materials. All materials requested by the Engineer shall be provided at the contractor’s expense to the Central Laboratory in Dover in a timely manner upon request. To verify the complete mixture design and evaluate the suitability of all materials, the following approximate quantities are required:

- 5.25 gal (20 liters) of the asphalt binder;
- 0.13 gal (0.5 liters) sample of liquid heat-stable anti-strip additive;
- 254 lb. (115 kg) of each coarse aggregate;
- 154 lb. (70 kg) of each intermediate and fine aggregate;
- 22 lb. (10 kg) of mineral filler; and
- 254 lb. (115 kg) of RAP, when applicable.

The proposed JMF shall include the following:

Plot of the design aggregate structure on the FHWA Superpave 0.45 power chart showing the maximum density line, Superpave control points, and recommended restricted zone.

Plot of the three trial asphalt binder contents at $\pm 0.5\%$ gyratory compaction curves where the percent of maximum specific gravity (% of G_{mm}) is plotted against the log base ten of the number of gyrations (log (N)) showing the applicable criteria for $N_{initial}$, N_{design} , and N_{max} .

Plot of the percent asphalt binder by total weight of the mix (P_b) versus the following:

% of G_{mm} at N_{design} , VMA at N_{design} , VFA at N_{design} , Fines to effective asphalt binder (P_{be}) ratio, and unit weight (kg/m^2) at both N_{design} and N_{max} .

Summary of the consensus property standards test results for the design aggregate structure, summary of the source property standards test results for the individual aggregates in the design aggregate structure, target value of the asphalt binder content, and a table of G_{mm} of the asphalt mixture for the four trial asphalt binder contents determined according to T209.

The JMF shall also include the NCAT Ignition Oven calibration for the specific materials utilized for this mix.

Construction:

Production Plants. The contractor shall modify and/or operate their production plant as required by the manufacturer to introduce the WMA technology.

Weather Limitations. Place mix only on dry, unfrozen surfaces.

The minimum ambient temperature shall be 32 degrees F.

The following table of ambient temperatures for various binder grades and lift thicknesses for placement with the following parameters:

- Minimum surface temperature of 32 degrees F
- Maximum production temperature of 275 degrees F
- Maximum wind speed of 8 miles per hour

Lift Thickness (in)	PG Binder		
	76-22	70-22	64-22
1.50	50F	45F	40F
2.00	40F	38F	35F
3.00	32F	32F	32F

Construction outside of these conditions will be at the discretion of the Engineer.

Compaction:

Compaction shall be tested and paid per Item 401699 - Quality Control/Quality Assurance of Bituminous Concrete .05 (b) Pavement Construction - Tests and Evaluations.

Method of Measurement and Basis of Payment:

Method of Measurement and Basis of Payment will be in accordance with Subsections 401.14 and 401.15 of the Standard Specifications.

The item 401699, will define adjustment factor to be applied to the bituminous concrete payments for bonus or penalty.

9/6/11

401699 - QUALITY CONTROL/QUALITY ASSURANCE OF BITUMINOUS CONCRETE

.01 Description.

This item shall govern the Quality Control/Quality Assurance Testing for supplying hot-mix asphalt plant materials and constructing hot-mix asphalt pavements.

The Contractor shall be responsible for providing the quality level of materials and construction incorporated into the Contract that will meet the requirements of the Contract. The Contractor shall perform all necessary quality control inspection, sampling, and testing. The Engineer will evaluate all materials and construction for acceptance. The procedures for Quality Control and Acceptance are described in this Section.

.02 Definitions.

Acceptable Quality Level (AQL): That level of percent within limits (PWL) to which the Engineer will consider the work completely acceptable.

Acceptance Plan: Factors that comprise the Engineer's determination of the degree of compliance with contract requirements and value of the product. These factors include the Engineer's sampling, testing, and inspection.

Delaware Asphalt Pavement Association (DAPA): The organization representing the interests of hot-mix asphalt producers and Contractors. The Engineer has a copy of the DAPA officers' names and point(s) of contact.

Dispute Resolution: The procedure used to resolve conflicts resulting from discrepancies between the Engineer's and the Contractor's results of sufficient magnitude to impact payment. The testing will take place at a location and time mutually agreeable by both the Engineer and the Contractor.

Full Depth Construction – Construction of an adequate pavement box on a subgrade and subbase prepared by the contractor

Independent Assurance: An unbiased and independent verification of the Quality Assurance system used, and the reliability of the test results obtained in regular sampling and testing activities. The results of Independent Assurance are not to be directly used as a basis of material acceptance.

Job Mix Formula (JMF)/Mixture Identification (ID): The target values for individual aggregate size gradation percentages and the asphalt percentage, the sources of each of the component materials, the proposed proportions of component materials to be used to meet those target values, the asphalt proportion, and the mixing temperature. The Engineer will assign uniquely individual mixture identification for each JMF submitted and approved.

Lower Quality Index (QL): The index reflecting the statistic related to the lower boundary to which a sample (or sample statistic) may deviate from the target value and still be considered acceptable.

Mean: A statistical measure of the central tendency – the average value.

Operational Day: A day in which the Engineer has approved a lane closure for the Contractor to perform work within an approved MOT plan.

Percent Within Limits (PWL): That amount of material or workmanship that has been determined, by statistical method, to be within the pre-established characteristic boundary(ies).

Qualified Laboratory: A laboratory mutually agreed upon by both DAPA and the Engineer as having proper test equipment that has been calibrated in accordance to AASHTO.

Qualified Technician: Personnel mutually agreed upon by both DAPA and the Engineer as having adequate training, experience, and abilities to perform the necessary testing. The minimum qualifications are either a recognized nationally accredited or certified Superpave testing certificate or been working in hot-mix asphalt testing for at least one year.

Quality Assurance (QA): All those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality.

Quality Control (QC): The sum total of the activities performed by the Contractor in order to assure that the product meets contract requirements.

Quality Control (QC) Plan: The detailed description of the type and frequency of inspection, sampling, and testing deemed necessary to measure and control the various properties governed by the Specifications. The QC Plan must address the actions needed to keep the process in control, detect when the process is going out of control, and responses to correct the situation(s).

Quality Level Analysis: A statistical procedure that provides a method for estimating the percentage of each lot or subplot of material, product, item of construction, or completed construction that may be expected to be within specified tolerances.

Standard Deviation: A term used in statistics to indicate the value calculated from the square root of the difference between the individual measurements in a group and their average. Standard

deviation is calculated by taking the square root of the sum of the squares of the differences of each of n values and the mean value, this sum first divided by (n-1).

Target Value: The acceptable value for a controlling characteristic of a product. The JMF will establish each of these values for the material.

Test Methods: Shall be AASHTO test methods. Copies of these test methods shall be available at each qualified laboratory.

Upper Quality Index (QU): The index reflecting the statistic related to the upper boundary to which a sample (or sample statistic) may deviate from the target value and still be considered acceptable.

Volumetric Properties: Air voids, voids in mineral aggregates (VMA), voids filled with asphalt (VFA), and dust to effective asphalt.

.03 Equipment.

(a) Material Production Test Equipment.

The Contractor shall establish, maintain, and operate a qualified testing laboratory at the production plant site of sufficient size and layout that will accommodate the testing operations of both the Contractor and the Engineer. The Contractor shall maintain all the equipment used for handling, preparing, and testing materials in proper operating condition. For any laboratory equipment malfunction, the Contractor shall remedy the situation within one working day or the Engineer may reject production. In the case of an equipment malfunction, and while waiting for repairs to equipment, the Engineer may elect to test the material at either another production facility or the Engineer's laboratory to obtain payment factors.

The following shall be the minimum calibrations for the referenced equipment:

- SUPERPAVE^R Gyratory Compactor: once every year; verified once every month by the Engineer.
- Ovens: once every three months, verified once every month.
- Vacuum Container and Gauge (Rice Bowls): once every three months, verified once every month.
- Balances and Scales: once every year, verified once every month.
- Thermometers: once a year; verified once every month.
- Gyratory Compactor molds and base plates: once every year
- Mechanical Shakers: once every year
- Sieve Verifications: once every year

All calibrations shall be documented and on file for review by the Engineer at any time.

(b) Pavement Construction Test Equipment.

The Contractor shall furnish and use in-place density gauges, or coring equipment, or both, as necessary to meet the requirements of these Specifications.

.04 Quality Control (QC) Plan.

(a) Material Production QC.

(1) Job Mix Formula – Material Production.

The Contractor shall submit for approval to the Engineer the job mix formula (JMF) design of the component materials and target characteristic values for each mixture proposed for use. Once the JMF is submitted to the Engineer, the Engineer will have up to three weeks to review the submitted information. However, a provision for a more timely approval is available to the Contractor; first, the Contractor shall submit the proper documentation on Pinepave mixture design software for the Engineer's approval. After that approval from the Engineer, the Contractor shall produce the new mixture for a non-Department project. The Engineer will test the material, by taking three series per the specifications. If the Engineer's test results are within the specifications, then the mixture will be approved by the Engineer for Department projects.

The component materials design shall include designating the source and the expected proportion (within 1 percent for the aggregate components, and within 0.1 percent for the other components) of each component to be used in order to produce workable hot-mix asphalt having the specified properties. For plant component feed adjustments, RAP can be considered in the same manner as an individual aggregate component. The JMF target characteristic values include the mixing temperature range, core temperature range for gyration, the percentage of the asphalt cement component (both total and virgin), and the percentages of the aggregate amounts retained on the sieves to be addressed by the JMF as shown in Table 1.

The Contractor shall provide an ignition oven correction number for each JMF. The Contractor shall also supply to the Engineer weighed material of each JMF so correction numbers can be established for the Engineer's equipment for Dispute Resolution samples.

Prior to starting production of a new mixture, the Contractor shall submit a JMF. For any mixture that has a 20% or greater failure rate on any combined volumetric criteria, the JMF will not be approved for use on Department contracts. In order to be approved, a re-design of the mixture will have to be completed by the Contractor for review and approval by the Engineer. The Contractor shall uniquely title each JMF. The Contractor shall submit test data with each JMF and tests performed by a Qualified Laboratory on representative materials, verifying the adequacy of the design. Refer to the specifications for each mix type in order to determine the design requirements. The JMF sieve percentage values shall conform to the ranges shown in Table 1.

If there is a change in the source of any of the component materials, other than asphalt, if there is a change in the proportions of the aggregate components or the percent passing for each sieve by more than 5 percent from the submitted JMF, or if there is a change in the percentage of the asphalt cement component by 0.2 percent or more, which causes the volumetrics to change from the originally submitted JMF, a new JMF is required. Also, if the asphalt cement target percentage is lowered, all volumetric criteria must still be achieved.

According to the Contractor's QC Plan, the Contractor shall inform the Engineer of any proposed changes to an existing JMF. The Contractor shall notify the Engineer by electronic mail of the proposed changes. The Engineer will reply to the proposed changes within one operational day and notify the Contractor of the effective date of the changes.

Although a new JMF is not required, the Contractor must notify the Engineer of any change in the proportions of the components. This notification shall include the total change made from the approved JMF proportions, and the effective time of the change.

All submitted JMF's shall correspond to the Pinepave mixture design software. The Engineer, for evaluation of the submitted JMF, will use the first three test samples. These test results acquired during production shall be within the following range compared to the submitted JMF on the Pinepave mixture design software: G_{mm} : +/- 0.030 and G_{mb} : +/- 0.040

Table 1 - Aggregate Gradation - JMF and Control Point Information

Sieves to be addressed by JMF/Range values are percentages passing by weight										
Sieve Size mm (inch)	4.75 mm	4.75mm Range	9.5 mm	9.5mm Range	12.5 mm	12.5mm Range	19.0 mm	19.0mm Range	25.0 mm	25.0mm Range
37.5(1.5)	No		No		No		No		Yes	100
25.0(1.0)	No		No		No		Yes	100	Yes	90-100
19.0 (3/4)	No		No		Yes	100	Yes	90-100	Yes	20-90
12.5(1/2)	Yes	100	Yes	100	Yes	90-100	Yes	23-90	Yes	
9.5 (3/8)	Yes	95-100	Yes	90-100	Yes	28-90	Yes		Yes	
4.75(#4)	Yes	90-100	Yes	32-90	Yes		Yes		Yes	
2.36(#8)	Yes		Yes	32-67	Yes	28-58	Yes	23-49	Yes	19-45
(#16)	Yes	30-60	Yes		Yes		Yes		Yes	
(#30)	Yes		Yes		Yes		Yes		Yes	
(#50)	Yes		Yes		Yes		Yes		Yes	
(#100)	Yes		Yes		Yes		Yes		Yes	
.075(#200)	Yes	6-12	Yes	2-10	Yes	2-10	Yes	2-8	Yes	1-7

(2) Process Control – Material Production.

The Contractor shall submit in writing (letter or electronic mail) a QC Plan from each proposed production plant to the Engineer; no hot-mix asphalt material will be accepted until the Engineer approves the QC Plan. This plan must be submitted to the Engineer on an annual basis for review and approval prior to material production. The Engineer will send a signed copy back to the Contractor stating that it is approved. The approved QC Plan shall govern contractor operations.

The following are considered significant violations to the Contractor's QC Plan:

Using testing equipment that is knowingly out of calibration or is not working properly.

Reporting false information such as test data, JMF information, or any info requested by DelDOT

When the Contractor fails to comply to their approved QC Plan in reference to materials testing

Substantial deviations to AASHTO or DelDOT procedures when running tests, sampling stockpiles, or testing hot mix.

The use of any material not listed in the JMF.

The use of the wrong PG graded asphalt.

If samples fall within the Contractors action points in the QC Plan but the Contractor fails to take the corrective action in the approved QC Plan

If a Contractor is found in violation of any of these items, they will receive a written warning for their first violation. If the Contractor is found in violation a second time on any of the criteria, they will forfeit any bonus from that day's production. If the Contractor is found in violation a third time on any of the criteria, they will receive a five percent (5%) deduction for that day's production. If the Contractor is found in violation a fourth time, the plant will not be approved for production until such time that the Contractor addresses the violation of the QC plan to the satisfaction of the Engineer. If the Engineer approves the changes in advance, the Contractor may make changes to the QC Plan. All changes shall be submitted and approved in writing by the Engineer.

The QC Plan shall include actions that will assure all materials and products will conform to the specifications, whether manufactured or processed by the Contractor, or procured from suppliers, subcontractors, or vendors. The Contractor shall perform the inspection and tests required to substantiate product conformance to contract requirements. The Contractor shall document QC inspections and tests, and provide copies to the Engineer when requested. The Contractor shall maintain records of all inspections and tests for at least one year. The records shall include the date, time, and nature of deficiency or deficiencies found; the quantities of material involved until the deficiency was corrected; and the date, time, and nature of corrective actions taken.

In the QC Plan, the Contractor shall detail the type and frequency of inspection, sampling, and testing deemed necessary to measure and control the various properties of material and construction governed by the Specifications. The QC Plan shall include the following elements as a minimum:

Production Plant – make, type, capacity, and location.

Production Plant Calibration – components and schedule; address documentation.

Personnel – include name and telephone number for the following individuals:

Person responsible for quality control.

Qualified technician(s) responsible for performing the inspection, sampling, and testing.

Person who has the authority to make corrective actions on behalf of the Contractor.

Testing Laboratory – state the frequency of accuracy checks and calibrations of the equipment used for testing; address documentation.

Locations where samples will be obtained and the sampling techniques for each test

Load number of QC samples (1-10 if QA sample is not within trucks 1-10)

Tests to be performed and their normal frequency; the following, at a minimum, shall be conducted:

Mixture Temperature: each of the first five trucks, and each load that is sampled for QC or acceptance testing.

Gradation analysis of aggregate (and RAP) stockpiles – one washed gradations per week for each aggregate stockpile; RAP: five gradations and asphalt cement contents for dedicated stockpiles where new material is not being added; one

gradation and asphalt cement content test per week for stockpiles where material is continually being added to the stockpile.

Gradation analysis of non-payment sieves

Dust to effective asphalt calculation

Moisture content analysis of aggregates – daily.

Gradation analysis of the combined aggregate cold feed – one per year per mixture.

Bulk specific gravity and absorption of blended material – one per year per mixture.

Ignition Oven calibration – one per year per mixture.

Hot-Bins: one per year per mixture.

Others, as appropriate.

Procedures for reporting the results of inspection and tests (include schedule).

Procedures for dealing with non-compliant material or work.

Presentation of control charts. The Contractor shall plot the results of testing on individual control charts for each characteristic. The control charts shall be updated within one working day as test results for each subplot become available. The control charts shall be easily and readily accessible at the plant laboratory. The following parameters shall be plotted from the testing:

Asphalt cement content.

Volumetrics (air voids, voids in mineral aggregates [VMA])

Gradation values for the following sieves:

- 4.75 mm (#4).
- 2.36 mm (#8).
- 0.075 mm (#200).

Operational guidelines (trigger points) to address times when the following actions would be considered:

Increased frequency of sampling and testing.

Plant control/settings/operations change.

JMF adjustment.

JMF change (See Section .04(a)(1)).

Change in the source of the component materials.

Calibration of material production equipment (asphalt pump, belt feeders, etc.).

Rejection of material.

When any point of non-compliance with the QC plan, or material not meeting the Specifications, comes to the attention of either the Contractor or the Engineer, the other party shall be notified immediately, and the Contractor shall take appropriate corrective actions. Failure to take corrective actions immediately shall be cause for rejection of material or work by the Engineer.

(b) Pavement Construction – Process Control.

The Contractor shall perform Quality Control of pavement compaction by testing in-place pavement with a density gauge or by testing cores extracted from the pavement. The use of the nuclear density gauge shall conform to ASTM D2950; the use of other density gauges shall be as per the manufacturer's recommendations and approved by the Engineer. The Contractor may use any method to select locations for the Quality Control.

.05 Acceptance Plan.

(a) Material Production – Tests and Evaluations.

The Engineer will conduct acceptance tests. The Engineer will directly base acceptance on the acceptance test results, the asphalt cement quality, the Contractor's QC Plan work, and the comparisons of the acceptance test results to the QC test results. The Engineer may elect to utilize test results of the Contractor in some situations toward judging acceptance. All acceptance tests shall be performed by qualified technicians at qualified laboratories following AASHTO or DelDOT procedures, and shall be evaluated using Quality Level Analysis.

The Contractor shall supply, capture, and mark samples, as directed, from delivery trucks before the trucks leave the production plant. The sample shall represent the material produced by the Contractor, and shall be of sufficient size to allow the Engineer to complete all required acceptance tests. The Engineer will direct the Contractor when to capture these samples, on a statistically random, unbiased basis, established before production begins each day based upon the anticipated production tonnage. The captured sample shall be from the Engineer specified delivery truck; if the Contractor visually observes the specified delivery truck sample and does not want this sample to be sampled and tested for acceptance, that delivery truck will

not be sent to a Department project. The next visually acceptable delivery truck to the Contractor shall be sampled for acceptance testing.

The first sample of the production day will be randomly generated by the Engineer between loads 0 and 12 (0-250 tons). Subsequent samples will be randomly generated by the Engineer on 500-ton sub-lots for the production day. Unacceptable samples may be a basis for rejection of material if the QC plan is not followed as approved for sample retrieval. If the Contractor wishes to perform parallel tests with the Engineer, or to capture samples to be retained for possible Dispute Resolution, each of the samples for these purposes shall be obtained at the same time and location as the acceptance test sample. Either splitting a large sample or getting multiple samples that equally represent the material is acceptable. The Engineer will perform all splitting and handling of samples after they are obtained by the Contractor.

The Engineer will evaluate and accept the material on a lot basis. All the material within a lot shall have the same JMF (mixture ID). The lot size shall be targeted for 2000 tons or a maximum period of three days, whichever is reached first. If the 2000th ton target lot size is achieved during a production day, the lot size shall extend to the end of that production day. The Contractor may interrupt the production of one JMF in order to produce different material; this type of interruption will not alter the determination of the size or limits of material represented by a lot. The Engineer will evaluate each lot on a subplot basis. The size for each subplot shall be 100 to 500 tons and testing for the sub lots will be completed on a daily basis. For each subplot, the Engineer will evaluate one sample.

The target size of sub-lots within each lot, except for the first sample of the production day, is equal-sized 500 ton sub lots and will be based upon anticipated production, however, more or fewer sublots, with differing sizes, may result due to the production schedule and conditions. If the actual production is less than anticipated, and it's determined a sample will not be obtained (based upon the anticipated tonnage), a new sample location will be determined on a statistically random, unbiased basis based upon the new actual production. If the actual production is going to be 50 tons or greater over the anticipated sub lot production, a new sample location will be determined on a statistically random, unbiased basis based upon the new actual production. The Engineer will combine the evaluation and test results for all of the applicable sublots in order to evaluate each individual lot.

If the Engineer is present, and the quantity exceeds 25 tons, a statistically random sample will be used for analysis. When the anticipated production is less than 100 tons and greater than 25 tons, and the Engineer is not present, the contractor shall randomly select a sample using the Engineer's random location program. The captured sample shall be placed in a suitable box, marked to the attention of the Engineer, and submitted to the Engineer for testing. A box sample shall also be obtained by the contractor at the same time and will be used as the Dispute Resolution sample if requested by the Engineer. The contractor shall also obtain one liquid asphalt sample (1 pint) per grade of asphalt used per day and properly label it with all pertinent information.

The Engineer will conduct the following tests in order to characterize the material for the pavement compaction quality, and to judge acceptance and the pay adjustment for the material:

AASHTO T312 – Preparing a mixture samples using a gyratory compactor.
AASHTO T166, Method C (Rapid Method) – Bulk specific gravity of compacted samples.
AASHTO T308 – Asphalt cement content.
AASHTO T30 – Aggregate gradations, using samples from the asphalt cement content test.
AASHTO T209 – Theoretical maximum specific gravity.
ASTM Provisional Test Method – Rapid Drying of Compacted and Loose Bituminous Asphalt Specimens using Vacuum Drying Method

(b) Pavement Construction – Tests and Evaluations.

The Engineer will directly base acceptance on the compaction acceptance test results, and on the inspection of the construction, the Contractor's QC Plan work, ride smoothness as referenced in the contract documents, lift thickness as referenced in the contract documents, joint quality as referenced in the contract documents, surface texture as referenced in the contract documents, and possibly the comparisons of the acceptance test results to the independent test results. For the compaction acceptance testing, the Engineer will sample the work on a statistically random basis, and will test and evaluate the work using lots.

Prior to paving a road segment, the Contractor shall notify the Engineer of any locations within that road segment that may not be suitable to achieve minimum (93%) compaction due to existing conditions. The Contractor shall schedule and hold a meeting in the field with the Engineer in order to discuss all areas that may potentially be applicable to Table 5a before paving starts. Areas that will be considered for Table 5a will be investigated in accordance to the method described in Appendix B. If this meeting is not held prior

to paving, no areas will be considered for Table 5a. Areas of allowable exemptions that will not be cored include the following: partial-depth patch areas, driveway entrances, paving locations of less than 100 tons, areas around manholes and driveway entrances, and areas of paving that are under 400 feet in continuous total length and/or 5 feet in width.

The exempt areas around manholes will be a maximum of 4 feet transversely on either side from the center of the manhole, and 20 feet longitudinally on either side from the center of the manhole. The exempt areas around driveway entrances shall be the entire width of the driveway, and 3 feet from the edge of the longitudinal joint next to the driveway. Areas of exemption that will be cored for informational purposes only shall include: areas where the mat thickness is less than three times the nominal maximum aggregate size as directed by the Engineer, violations of Section 401.08 in the Standard Specifications as directed by the Engineer, and areas shown to contain questionable subgrade properties as proven by substantial yielding under a fully legally loaded truck. Failure to obtain core samples in these areas will result in zero payment for compaction regardless of the exempt status.

The Engineer will evaluate and accept the compaction work on a daily basis. Payment for the compaction will be calculated by using the material production lots as referenced in **.05 Acceptance Plan (a) Material Production – Tests and Evaluation** and analyzing the compaction results over the individual days covered in the material production lot. The compaction results will be combined with the material results to obtain a payment for this item.

The minimum size of a compaction lot shall be 100 tons. If the compaction lot is between 101 and 1000 tons, the Engineer shall randomly determine four compaction acceptance test locations. If the compaction lot is between 1001 and 1500 tons, the Engineer shall randomly determine six compaction acceptance test locations. If the compaction lot is between 1501 and 2000 tons, the Engineer shall randomly determine eight compaction acceptance test locations. If the compaction lot is greater than 2000 tons, the Engineer shall randomly determine two compaction acceptance test locations per 500 tons.

If a randomly selected area falls within an Engineer approved exemption area, the Engineer will select one more randomly generated location to be tested per the requirements of this Specification. If that cannot be accomplished, or if an entire location has been declared exempt, the compaction testing shall be performed as per these Specifications but a note will be added to the results that the location was an Engineer approved exempt location.

Testing locations will be a minimum of 1.5 feet from the newly placed longitudinal joint and 50 feet from a new transverse joint. If the Contractor chooses to cut companion cores, they shall be located within one foot of the Engineers cores along the longitudinal direction and in-line with the Engineers cores in the longitudinal plane.

Exactly at the locations marked by the Engineer, the Contractor shall cut a core, 6 inches in diameter, through the full lift depth. Cores submitted that are not from the location designated by the Engineer will not be tested and will be paid at zero pay.

The Contractor shall notify the Engineer prior to starting paving operations with approximations of the tonnage to be placed. The Contractor is then responsible for notifying the appropriate Engineer test personnel within 12 hours of material placement. The Engineer will then have 24 hours to mark the core locations. After determination of locations, the Contractor shall complete testing within two operational days of the locations being marked. If the cores are not cut within two operational days, the area in question will be paid at zero pay for compaction testing.

The Contractor shall provide any traffic control required for the structural number investigation, sampling, and testing work at no additional cost to the Department.

The Contractor shall cut each core with care in order to prevent damaging the core. The pavement shall have a maximum temperature of 140 °F when cores are cut from it. Immediately upon removal of a core from the roadway, the Contractor shall adequately label it. The Contractor shall protect the core by supplying a 6-inch plastic concrete cylinder mold, or an approved substitute, and placing the core in it. If more than one core is in the same mold, the Contractor shall place paper between them. The Contractor shall attach a completed QC test record for the representative area to the corresponding core. The Engineer will also complete a test record for areas tested for the QA report and provide to Materials & Research. At the end of every production day, the Contractor shall deliver the cores to the Engineer for testing, processing, and report distribution.

The Contractor shall repair the core hole per Appendix A, Repairing Core Holes in Hot-Mix Asphalt Pavements. Core holes shall be filled immediately. Failure to repair core holes at the time of coring will result in zero pay for compaction testing for the area in question.

The Engineer will conduct the following tests on the applicable portion of the cores in order to evaluate their quality:

AASHTO T166, Method C (Rapid Method) – to determine the bulk specific gravity of the cores.

AASHTO T209 – to calculate the theoretical maximum specific gravity and the density of the non-compacted mixtures.

ASTM Provisional Test Method – Rapid Drying of Compacted and Loose Bituminous Asphalt Specimens using Vacuum Drying Method.

The Engineer will use the average of the last five test values of the same JMF (mixture ID) material at the production plant in order to calculate the average theoretical maximum specific gravity of the cores. The average will be based on the production days test results and as many test results needed from previous days production to have an average of five samples. If there are less than five values available, the Engineer will use the JMF design value in addition to the available values to calculate the average theoretical maximum specific gravity.

.06 Payment and Pay Adjustment Factors.

The Contractor shall include the costs for all materials, labor, equipment, tools, and incidentals necessary to meet the requirements of this specification in the bid price per ton for the hot-mix asphalt. Payment to the Contractor for the hot-mix asphalt item(s) will be based on the Contract price per ton and the pay adjustments described in this specification. The Engineer will determine pay adjustments for the hot-mix asphalt item(s) based on the Acceptance Plan. The Engineer will determine both a pay adjustment for the material and a pay adjustment for the pavement construction. Note that the material portion of the total pay adjustment is 70 percent and the pavement construction portion is 30 percent. For replaced material or work, the Engineer will not apply the Pay Adjustment applicable to the material or work replaced; a new Pay Adjustment will be calculated based on the qualities of the new material. Even if one portion of the pay adjustment (material or construction) is not applied, the Engineer may apply the pay adjustment to the other portion. All adjustments (bonus or penalty) shall be paid under this item number in the contract.

(a) Material Production – Pay Adjustment.

The Engineer will determine the material pay adjustment by evaluating the production material based on the following parameters:

Gradation of the 2.36 mm (#8) sieve.
Gradation of the 0.075 mm (#200) sieve.
Asphalt cement content.
Air void content

Using the JMF target value, the single test tolerance (from Table 3), and the test values, the Engineer will use the following steps to determine the material pay adjustment factor for each lot of material:

1. For each parameter, calculate the mean value and the standard deviation of the test values for the lot to the nearest 0.1 unit.
2. For each parameter, calculate the Upper Quality Index (QU):
$$QU = ((JMF \text{ target}) + (\text{single test tolerance}) - (\text{mean value})) / (\text{standard deviation}).$$
3. For each parameter, calculate the Lower Quality Index (QL):
$$QL = ((\text{mean value}) - (JMF \text{ target}) + (\text{single test tolerance})) / (\text{standard deviation}).$$
4. For each parameter, locate the values for the Upper Payment Limit (PU) and the Lower Payment Limit (PL) from Table 2 – Quality Level Analysis by the Standard Deviation Method. (Use the column for “n” representing the number of sublots in the lot. Use the closest value on the table when the exact value is not listed).
5. Calculate the PWL for each parameter from the values located in the previous step:
$$PWL = PU + PL - 100.$$
6. Calculate each parameter’s contribution to the payment adjustment by multiplying its PWL by the weight factor shown in Table 3 for that parameter.
7. Add the calculated adjustments of all the parameters together to determine the Composite PWL for the lot.

8. From Table 4, locate the value of the Pay Adjustment Factor corresponding to the calculated PWL.
9. For each lot, determine the final material price adjustment:

Final Pay Adjustment =

(Lot Quantity) x (Item Bid Price) x (Pay Adjustment Factor) x 70%. This final pay calculation will be paid to the tenth of a percent.

In lieu of being assessed a pay adjustment penalty, the Contractor may choose to remove and replace the material at no additional cost to the Department. If the PWL of any single material characteristic is below 60, the Engineer may require the removal and replacement of the material at no additional cost to the Department.

The test results from the Engineer on production that is less than 100 tons will be combined with the two most recently completed Engineer tests with the same Mixture ID to calculate payment for the lot encompassing the single test. If that cannot be accomplished, the approved JMF will be used to calculate payment for the lot encompassing the single test. Payment for previously closed lots will not be affected by the analysis.

When a sample is out of the acceptable tolerance for any Materials pay criteria, that sample will be isolated. For payment purposes, the test result of the out of acceptable tolerance sample will be combined with the two previous acceptable samples of the same JMF and analyzed per this specification. The material that is considered out of the acceptable tolerance will only include the material within the represented sub-lot (i.e., a maximum of 500 tons). If the previous acceptable test result is from the previous production day, only the material produced on the second production day will be considered out of tolerance. All future sub lots will not include the isolated test.

If, during production, a QA sample test result does not meet the acceptable tolerances and the Contractors QC sample duplicates the QA sample test result, the Contractor can make an appropriate change to the mixture (within the JMF boundaries), and request to have that sample further isolated. If this request is approved, and the Contractor has made a change, the third load after the change will be tested. If that sample test result shows compliance with the specifications, the material that is considered out of the acceptable tolerance will include the material from the previous acceptable test result to the third load after the initially sampled and tested sample. If the sample does not meet the specification requirements, the Engineer will no longer accept material. Production may resume when changes have been made and an acceptable sample and test result is obtained.

Table 2 – Quality Level Analysis by the Standard Deviation Method							
PU or PL	QU and QL for “n” Samples						
	n = 3	n = 4	n = 5	n = 6	n = 7	n = 8	n = 9
100	1.16	1.50	1.79	2.03	2.23	2.39	2.53
99		1.47	1.67	1.80	1.89	1.95	2.00
98	1.15	1.44	1.60	1.70	1.76	1.81	1.84
97		1.41	1.54	1.62	1.67	1.70	1.72
96	1.14	1.38	1.49	1.55	1.59	1.61	1.63
95		1.35	1.44	1.49	1.52	1.54	1.55
94	1.13	1.32	1.39	1.43	1.46	1.47	1.48
93		1.29	1.35	1.38	1.40	1.41	1.42
92	1.12	1.26	1.31	1.33	1.35	1.36	1.36
91	1.11	1.23	1.27	1.29	1.30	1.30	1.31
90	1.10	1.20	1.23	1.24	1.25	1.25	1.26
89	1.09	1.17	1.19	1.20	1.20	1.21	1.21
88	1.07	1.14	1.15	1.16	1.16	1.16	1.17
87	1.06	1.11	1.12	1.12	1.12	1.12	1.12

Table 2 – Quality Level Analysis by the Standard Deviation Method							
PU or PL	QU and QL for “n” Samples						
	n = 3	n = 4	n = 5	n = 6	n = 7	n = 8	n = 9
86	1.04	1.08	1.08	1.08	1.08	1.08	1.08
85	1.03	1.05	1.05	1.04	1.04	1.04	1.04
84	1.01	1.02	1.01	1.01	1.00	1.00	1.00
83	1.00	0.99	0.98	0.97	0.97	0.96	0.96
82	0.97	0.96	0.95	0.94	0.93	0.93	0.93
81	0.96	0.93	0.91	0.90	0.90	0.89	0.89
80	0.93	0.90	0.88	0.87	0.86	0.86	0.86
79	0.91	0.87	0.85	0.84	0.83	0.82	0.82
78	0.89	0.84	0.82	0.80	0.80	0.79	0.79
77	0.87	0.81	0.78	0.77	0.76	0.76	0.76
76	0.84	0.78	0.75	0.74	0.73	0.73	0.72
75	0.82	0.75	0.72	0.71	0.70	0.70	0.69
74	0.79	0.72	0.69	0.68	0.67	0.66	0.66
73	0.75	0.69	0.66	0.65	0.64	0.63	0.63
72	0.74	0.66	0.63	0.62	0.61	0.60	0.60
71	0.71	0.63	0.60	0.59	0.58	0.57	0.57
70	0.68	0.60	0.57	0.56	0.55	0.55	0.54
69	0.65	0.57	0.54	0.53	0.52	0.52	0.51
68	0.62	0.54	0.51	0.50	0.49	0.49	0.48
67	0.59	0.51	0.47	0.47	0.46	0.46	0.46
66	0.56	0.48	0.45	0.44	0.44	0.43	0.43
65	0.52	0.45	0.43	0.41	0.41	0.40	0.40
64	0.49	0.42	0.40	0.39	0.38	0.38	0.37
63	0.46	0.39	0.37	0.36	0.35	0.35	0.35
62	0.43	0.36	0.34	0.33	0.32	0.32	0.32
61	0.39	0.33	0.31	0.30	0.30	0.29	0.29
60	0.36	0.30	0.28	0.27	0.27	0.27	0.26
59	0.32	0.27	0.25	0.25	0.24	0.24	0.24

Table 3 - Material Parameter Weight Factors		
Material Parameter	Single Test Tolerance (+/-)	Weight Factor
Asphalt Content	0.4	0.30
#8 Sive (19 mm or >)	7.0	0.30
#8 Sieve (12.5 mm or <)	5.0	0.30
#200 Sieve (0.075 mm) Sieve	2.0	0.30
Air Voids (4.0% Target)	1.5	0.10

Table 4 - PWL Pay Adjustment Factors	
PWL	Pay Adjustment Factor (%)
100	+5
99	+4
98	+3
97	+2
96	+1
95	0
94	(-1)
93	(-2)
92	(-3)
91	(-4)
PWL (when <91)	(PWL - 100)

(b) Pavement Construction – Pay Adjustments.

The Engineer will determine the pavement construction pay adjustment by evaluating the construction of the pavement, based on the following parameter:

Degree of compaction of the in-place material

Using the test values for the cores, the Engineer will use the following steps to determine the pavement construction pay adjustment for each lot of work. Note that the material portion of the total pay adjustment is 70 percent and the pavement construction portion is 30 percent.

1. Calculate the average density values from the subplot tests values, to the nearest 0.1 unit.
2. Calculate the Degree of Compaction:
Degree of Compaction =
 $((\text{Core Bulk Specific Gravity}) / (\text{Theoretical Maximum Specific Gravity})) \times 100\%$.
3. The average compaction for the sublots shall be averaged together for the compaction level of the lot. The lots compaction test level shall be averaged to the whole percent.
4. Locate the value of the Payment Adjustment Factor corresponding to the calculated degree of compaction from Table 5 or Table 5a.
5. Determine the pavement construction price adjustment by using the following formula:
Pay adjustment = (Lot Quantity) x (Bid Price) x (Pay Adjustment Factor) x 30%.

Table 5: Compaction Price Adjustment Highway Locations	
Degree of Compaction (%)	Pay Adjustment Factor (%)
>97	-100*
96	-3
95	0
94	0
93	+5
92	0
91	-15
90	-25
89	-30
≤88	-100*

* or remove and replace it at Engineer's discretion

Table 5a: Compaction Price Adjustment Other ¹ Locations	
Degree of Compaction (%)	Pay Adjustment Factor (%)
>96	-100*
95	-2
94	0
93	+3
92	0
91	0
90	0
89	-1
88	-5
87	-15
86	-25
85	-30
84	-100*

* or remove and replace at Engineer's discretion

¹ This chart is to be used for areas where the structural value of the area to be paved is less than 1.75 as determined by the Engineer. See Appendix B – Method for Obtaining Cores for Determination of Roadway Structure. This chart is applicable to rehabilitation work only; full depth construction will not be considered for Table 5a.

.07 Dispute Resolution.

Disputes or questions about any test result shall be immediately brought to the attention of the Contractor and the Engineer. When there is a significant alleged discrepancy regarding the Engineer's acceptance test results, the Contractor must claim a dispute within two operational days of the test date. The following dispute resolution procedures will be used.

The Engineer and the Contractor will review the sample quality, the test method, the laboratory equipment, and the laboratory technician. If these factors are not the cause of the dispute, a third party dispute resolution will be used.

For third party resolution testing, it can be either at another Contractor's laboratory, the Engineer's laboratory, or an independent accredited laboratory. Unless otherwise mutually agreed upon by DAPA and the Engineer, the Engineer's qualified laboratory in Dover and qualified personnel shall conduct the necessary testing for third party Dispute Resolution after the Engineer has provided reasonable notice to allow the Contractor to witness this testing.

When disputes over production testing occur, the samples used for Dispute Resolution testing will be those samples the Contractor properly captured, labeled, and stored, as described in the second paragraph of the section of these specifications titled **.05 Acceptance Plan, (a) Material Production – Tests and Evaluations**. If no samples are available, the original testing results will be used for payment calculations.

Dispute Resolution samples for air void content will be heated by a microwave oven.

If there is a discrepancy between the Engineer's acceptance test result and the Contractor's test result, the Contractor may ask for the Dispute Resolution sample to be tested. If the Dispute Resolution sample substantiates the original acceptance test result, the Contractor, after two such Dispute Resolution samples, will be charged a fee of \$125 for all further Dispute Resolution cores that substantiate the acceptance test result. If the Dispute Resolution sample substantiates the Contractor's test result, the Contractor will not be charged a fee.

When disputes over compaction core test results occur, the Engineer's acceptance core will be used for the dispute resolution sample. The Contractor will be advised on when the testing will occur as referenced above to witness the testing.

The results of the dispute resolution testing shall replace all of the applicable disputed test results for payment purposes.

7/28/11

Appendix A - Repairing Core Holes in Hot-Mix Asphalt Pavement

Description.

This appendix describes the procedure required to acceptably repair core holes in a bituminous concrete pavement.

Materials and Equipment.

The following material shall be available to complete this work:

Patch Material – A DelDOT approved High Performance Cold Patch material shall be used.

The following equipment shall be available to complete this work:

Sponge or other absorbent material – Used to extract water from the hole.

Compaction Hammer – Shall be mechanical, with a flat, circular tamping face smaller than 6 inches in diameter. The tamping head shall be connected to an electrical, pneumatic, or gasoline driven tamping device.

Construction Method.

After core removal from the hole, remove all excess water from within the hole, and prevent water from re-entering the hole.

Place the patch material in lifts no greater than 3 inches. If the hole is deeper than 3 inches, use two lifts of approximately equal depths so that optimum compaction is achieved. Make sure that the patch surface matches the grade of the existing roadway. Make every effort to achieve the greatest possible compaction

Performance Requirements.

The Engineer will judge the patch on the following basis:

The patch shall be well compacted

The patch surface shall match the grade of the surrounding roadway surface.

Basis of Payment.

No measurement or payment will be made for the patching work. The Contractor must gain the Engineer's acceptance of the patching work before the Engineer will accept the material represented by the core.

Appendix B - Method for Obtaining Cores for Determination of Roadway Structure

The Contractor is responsible for obtaining cores in areas that they propose are eligible for compaction price adjustments according to Table 5a in this specification. Table 5a is not applicable for new full-depth pavement box construction. Cores submitted for this process shall be obtained according to the following process.

1. Contact Materials & Research (M&R) personnel to determine if information about the area is already available. If M&R has already obtained cores in the location that is being investigated, the contractor may opt to use the laboratory information for the investigation and not core the area on their own.
2. If M&R does not have information concerning the section of the roadway, the contractor needs to contact M&R to arrange for verification of coring operations. Arrangements shall be made to allow for an individual from M&R to be on the site when the cores are obtained. Cores will be turned over to M&R for evaluation.
3. The contractor is responsible for providing all traffic control and repairing core holes in accordance to 401699 Appendix A – Repairing Core Holes in Hot-Mix Asphalt Pavements.
4. Cores are to be taken throughout the entire project for the area in question. Cores will be spaced, from the start of the project in increments determined based on field and project specifics. Cores will be evenly distributed throughout the project location. The cores will be taken in the center of the lane in question.
5. Additional cores may be taken at other locations, if surface conditions indicate that there may be a substantial difference in the underlying section. The location of these cores should be documented and submitted to M&R.
6. Cores shall be full depth and include underlying materials. If there is a stone base included in the pavement section, at a minimum 1 core must have information concerning the thickness of the base. This is determined by augering to the subgrade surface.
7. The calculations used to determine the structural capacity of the roadway is as follows. If the contractor finds, upon starting the coring process, that the areas are of greater thickness than applicable to Table 5a, they may terminate the coring process on their own and retract the request.

Structural Number Calculations

Each pavement box material is assigned a structural coefficient based upon AASHTO design guides. The structural coefficient is used to determine the total strength of the pavement section.

Materials used in older pavement sections are assigned lower structural coefficients to compensate for aging of the materials. The coefficients used to determine the structural number of an existing pavement are:

Existing Material	Structural Coefficient
HMA	0.32
Asphalt Treated Base	0.26
Soil Cement	0.16
Surface Treatment (Tar & Chip)	0.10
GABC	0.14
Concrete	0 - 0.7*

- * The Structural Coefficient of Concrete is dependent upon the condition of the concrete. Compressive strengths & ASR analysis are used to determine condition – contact the Engineer if this situation arises.

Newly placed materials use a different set of structural coefficients. They are as follows:

New Material	Structural Coefficient
HMA	0.40
Asphalt Treated Base (BCBC)	0.32
Soil Cement	0.20
GABC	0.14

Example:

Location includes placement of a 1.25" Type C overlay on 2.25" Type B. Existing roadway is cored and is shown to consist of 2" HMA on 7" GABC.

Calculation:

For the Type B lift the calculation would be:

$$\begin{array}{rcl}
 \text{Existing HMA} & 2 * 0.32 & = 0.64 \\
 \text{GABC} & 7 * 0.14 & = \underline{0.98} \\
 & & 1.62
 \end{array}$$

For the Type C lift the calculation would be:

$$\begin{array}{rcl}
 \text{Newly Placed B} & 2.25 * 0.4 & = 0.90 \\
 \text{Existing HMA} & 2 * 0.32 & = 0.64 \\
 \text{GABC} & 7 * 0.14 & = \underline{0.98} \\
 & & 2.52
 \end{array}$$

STATE OF DELAWARE
Department of Transportation
Contract Administration

ASPHALT CEMENT COST ADJUSTMENT

For this contract, payments to the Contractor shall be adjusted to reflect increases or decreases in the Delaware Posted Asphalt Cement Price when compared to the Project Asphalt Cement Base Price, as defined in these Special Provisions.

The Department will issue the Delaware Posted Asphalt Cement Price monthly and will be the industry posted price for Asphalt Cement, F.O.B. Philadelphia, Pennsylvania.

The Project Asphalt Cement Base Price will be the anticipated Delaware Posted Asphalt Cement Price expected to be in effect at the time of receipt of bids.

Actual quantity of asphalt cement qualifying for any Asphalt Cement Cost Adjustment will be computed on the asphalt percentage from the approved mix formula and the actual quantity of product delivered and accepted by the Department.

The asphalt cement cost adjustment will be calculated on grade PG 64-22 asphalt regardless of the actual grade of asphalt used. The Project Asphalt Cement Base Price for the project will be \$ 606.67 per English Ton. The asphalt cement cost adjustment will be calculated on the difference between the monthly Delaware Posted Asphalt Cement Price and any portion, either in excess of 105% or less than 95%, of the Project Asphalt Cement Base Price.

If the Contractor exceeds the authorized allotted delivery time, the price of asphalt cement on the last authorized allotted calendar day, shall be the price used for cost adjustment during the time liquidated damages are assessed. However, if the industry posted price for asphalt cement goes down, the asphalt-cement cost shall be adjusted downward accordingly.

Criteria for Eligibility of Cost Adjustment

The following conditions shall be met before a cost adjustment will be made:

The posted Asphalt Cement Price varies by more than +/- five (5) percent from the Project Asphalt Cement Base Price, and the material fully met Department specifications..

STATE OF DELAWARE
Department of Transportation
Contract Administration

QUANTITY SHEET
HIGHWAY BITUMINOUS PATCH MATERIAL
Contract No. DOT1203-BITUM_PATCH

Material/ District	Bituminous Patch Quantity (Tons)					
	Section A		Section B	Section C	Section C	Statewide
	North	Canal	Central	South I	South II	Totals
Type B	100	50	300	300	300	1,050
Type C	500	200	3,000	1,200	1,200	6,100

STATE OF DELAWARE
Department of Transportation
Contract Administration

BID QUOTATION REPLY SECTION

CONTRACT NO. **DOT1203-BITUM_PATCH**

HIGHWAY BITUMINOUS PATCH MATERIAL

Please fill out the attached forms fully and completely and return with your bid in a sealed envelope clearly displaying the contract number to the Department of Transportation / Contract Administration by January 31, 2012, 2:00 p.m. local time at which time bids will be opened.

Bids shall be submitted to:

**STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
CONTRACT ADMINISTRATION
800 BAY ROAD
DOVER, DE 19901**

PUBLIC BID OPENINGS

The public bid opening insures the citizens of Delaware that contracts are being bid fairly on a competitive basis and comply with Delaware procurement laws. The agency conducting the opening is required by law to publicly open the bids at the time and place specified and the contract shall be awarded within thirty (30) days thereafter. The main purpose of the bid opening is to reveal the name(s) of the bidders(s), not to serve as a forum for determining the apparent low bidders. The disclosure of additional information, including prices, shall be at the discretion of the contracting agency until such time that the responsiveness of each bid has been determined.

After receipt of a fully executed contract(s), the Delaware public and all bidders are invited to make an appointment with the contracting officer in order to review pricing and other non-confidential information.

ATTACHMENT 1

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
CONTRACT ADMINISTRATION
800 BAY ROAD
DOVER, DE 19901

NO BID REPLY FORM

BID # DOT1203-BITUM_PATCH

BID TITLE: HIGHWAY BITUMINOUS PATCH MATERIAL

To assist us in obtaining good competition on our Request for Bids, we ask that each firm that has received an invitation, but does not wish to bid, state their reason(s) below and return in a clearly marked envelope displaying the contract number. This information will not preclude receipt of future invitations unless you request removal from the Bidder's List by so indicating below, or do not return this form or bona fide bid.

Unfortunately, we must offer a "No Bid" at this time because:

_____ 1. We do not wish to participate in the bid process.

_____ 2. We do not wish to bid under the terms and conditions of the Request for Bid document. Our objections are:

_____ 3. We do not feel we can be competitive.

_____ 4. We cannot submit a Bid because of the marketing or franchising policies of the manufacturing company.

_____ 5. We do not wish to sell to the State. Our objections are: _____

_____ 6. We do not sell the items/services on which Bids are requested.

_____ 7. Other: _____

FIRM NAME

SIGNATURE

_____ We wish to remain on the Bidder's List **for these goods or services.**

_____ We wish to be deleted from the Bidder's List **for these goods or services.**

ATTACHMENT 2

CONTRACT NO.: DOT1203-BITUM_PATCH
TITLE: HIGHWAY BITUMINOUS PATCH MATERIAL
OPENING DATE: January 31, 2012

BIDDER INFORMATION

NOTE: Signature of the authorized representative **MUST** be of an individual who legally may enter his/her organization into a formal contract with the State of Delaware.

COMPANY NAME _____ (Check one)

	Corporation
	Partnership
	Individual

COMPANY ADDRESS _____

PHONE NUMBER _____ FAX NUMBER _____

EMAIL ADDRESS _____

FEDERAL E.I. NUMBER _____ STATE OF DELAWARE LICENSE NUMBER _____

	(circle one)		(circle one)		(circle one)	
COMPANY CLASSIFICATIONS: CERT. NO.	<u>Women Business Enterprise (WBE)</u>	Yes No	<u>Minority Business Enterprise (MBE)</u>	Yes No	<u>Disadvantaged Business Enterprise (DBE)</u>	Yes No

[The above table is for information and statistical use only.]

PURCHASE ORDERS SHOULD BE SENT TO:
 (COMPANY NAME) _____

ADDRESS _____

CONTACT _____

PHONE NUMBER _____ FAX NUMBER _____

EMAIL ADDRESS _____

AFFIRMATION: Within the past five years, has your firm, any affiliate, any predecessor company or entity, owner, Director, officer, partner or proprietor been the subject of a Federal, State, Local government suspension or debarment?

YES _____ NO _____ if yes, please explain _____

NAME OF AUTHORIZED REPRESENTATIVE
 (Please type or print) _____

SIGNATURE _____ TITLE _____

BID PROPOSAL FORMS

CONTRACT DOT1203-BITUM PATCH
SECTION A

SECTION A - (NORTH AND CANAL DISTRICT)

** ALL COLUMNS MUST BE COMPLETED AS INDICATED **

ALL FIGURES MUST BE TYPEWRITTEN

ITEM NO.	APPROX QTY	UNIT PRICE IN FIGURES MUST BE TYPEWRITTEN	AMOUNT
1	150	Bituminous Patch Material Type B \$ _____ UNIT TON	
2	700	Bituminous Patch Material Type C \$ _____ UNIT TON	
3	850	Delivery Charge per Ton \$ _____ UNIT TON	
<p style="text-align: center;">North and Canal District Total Bid Price \$ _____</p>			

BIDDERS MUST PROVIDE THE FOLLOWING SHIPPING POINT INFORMATION:

Bituminous Patch Material Type B shipping point:

Plant: Name: _____

Plant location: _____

Bituminous Patch Material Type C shipping point:

Plant: Name: _____

Plant location: _____

BID PROPOSAL FORMS

CONTRACT DOT1203-BITUM PATCH
SECTION B

SECTION B - (CENTRAL DISTRICT)

**** ALL COLUMNS MUST BE COMPLETED AS INDICATED ****
ALL FIGURES MUST BE TYPEWRITTEN

ITEM NO.	APPROX QTY	UNIT PRICE IN FIGURES MUST BE TYPEWRITTEN	AMOUNT
1	600	Bituminous Patch Material Type B \$ _____ UNIT TON	
2	4200	Bituminous Patch Material Type C \$ _____ UNIT TON	
3	4800	Delivery Charge per Ton \$ _____ UNIT TON	
Central District Total Bid Price \$ _____			

BIDDERS MUST PROVIDE THE FOLLOWING SHIPPING POINT INFORMATION:

Bituminous Patch Material Type B shipping point:

Plant: Name: _____

Plant location: _____

Bituminous Patch Material Type C shipping point:

Plant: Name: _____

Plant location: _____

BID PROPOSAL FORMS

CONTRACT DOT1203-BITUM PATCH
SECTION C

** ALL COLUMNS MUST BE COMPLETED AS INDICATED **

ALL FIGURES MUST BE TYPEWRITTEN

ITEM NO.	APPROX QTY	UNIT PRICE IN FIGURES MUST BE TYPEWRITTEN	AMOUNT
1	600	Bituminous Patch Material Type B \$ _____ UNIT TON	
2	2400	Bituminous Patch Material Type C \$ _____ UNIT TON	
3	3000	Delivery Charge per Ton \$ _____ UNIT TON	
South District Total Bid Price \$ _____			

BIDDERS MUST PROVIDE THE FOLLOWING SHIPPING POINT INFORMATION:

Bituminous Patch Material Type B shipping point:

Plant: Name: _____

Plant location: _____

Bituminous Patch Material Type C shipping point:

Plant: Name: _____

Plant location: _____

CERTIFICATION

Contract No. DOT1203-BITUM PATCH

The undersigned bidder, _____ whose address is _____
_____ and telephone number is _____ hereby certifies the following:

I/We have carefully examined the location of the proposed work, the proposed plans and specifications, and will be bound, upon award of this contract by the Department of Transportation, to execute in accordance with such award, a contract with necessary surety bond, of which contract this proposal and said plans and specifications shall be a part, to provide all necessary machinery, tools, labor and other means of construction, and to do all the work and to furnish all the materials necessary to perform and complete the said contract within the time and as required in accordance with the requirements of the Department of Transportation, and at the unit prices for the various items as listed on the preceding pages.

The foregoing quantities are considered to be approximate only and are given as the basis for comparison of bids. The Department of Transportation may increase or decrease the amount of any item or portion of the work as may be deemed necessary or expedient. Any such increase or decrease in the quantity for any item will not be regarded as a sufficient ground for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided in the contract.

I/We are licensed, or have initiated the license application as required by Section 2502, Chapter 25, Title 30, of the Delaware Code.

By submission of this proposal, each bidder and each person signing on behalf of any bidder, certifies as to its own organization, under penalty of perjury, that to the best of each signer's knowledge and belief:

1. The prices in this proposal have been arrived at independently without collusion, consultation, communication, or Agreement with any other bidder or with any competitor for the purpose of restricting competition.
2. Unless required by law, the prices which have been quoted in this proposal have not been knowingly disclosed and will not knowingly be disclosed by the bidder, directly or indirectly, to any other bidder or competitor prior to the opening of proposals.
3. No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a proposal for the purpose of restricting competition.

I/We acknowledge receipt and incorporation of addenda to this proposal as follows:

No.	Date								
-----	------	-----	------	-----	------	-----	------	-----	------

(FAILURE TO ACKNOWLEDGE RECEIPT OF ALL ADDENDA WILL RESULT IN THE BID BEING DECLARED NON-RESPONSIVE.)

Sealed and dated this _____ day of _____ in the year of our Lord two thousand and _____ (20__).

Name of Bidder (Organization)

Corporate
Seal

By: _____
Authorized Signature

Attest _____

Title

SWORN TO AND SUBSCRIBED BEFORE ME this ____ day of _____, 20__.

Notary
Seal

Notary

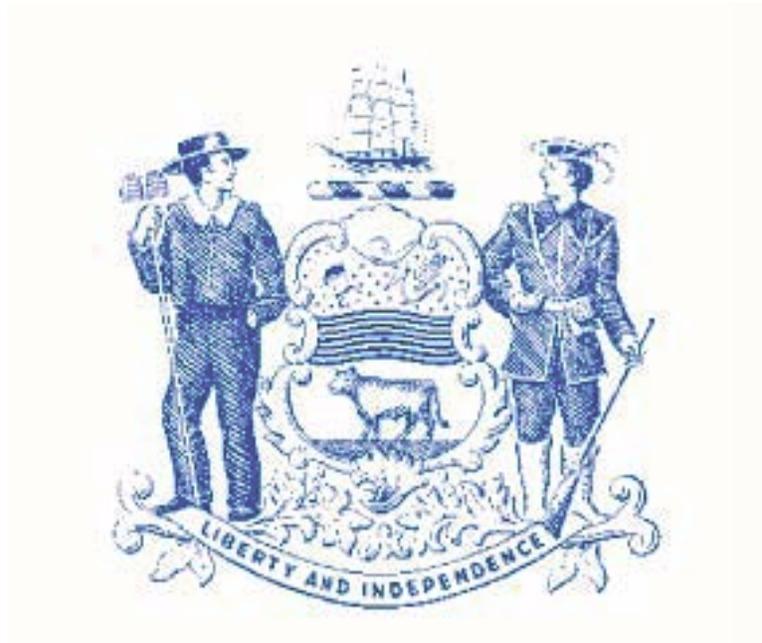
ATTACHMENT 5

OMWBE Certification Application found here:

<http://gss.omb.delaware.gov/omwbe/certify.shtml>

State of Delaware

**Office of Minority and Women Business Enterprise
Certification Information**



Complete application and mail, email or fax to:

Office of Minority and Women Business Enterprise (OMWBE)
100 Enterprise Place, Suite 4 Dover, DE 19904 Telephone: (302) 857-4554 Fax: (302) 677-7086
Email: deomwbe@state.de.us

Web site: <http://gss.omb.delaware.gov/omwbe/index.shtml>

Link to Certification Application: <http://gss.omb.delaware.gov/omwbe/certify.shtml>