



4 August 2017

MILITARY DEPARTMENT
STATE of NEBRASKA
LINCOLN, NEBRASKA

NEBRASKA ARMY NATIONAL GUARD
CATS-M 3rd STREET PAVING SUSTAINMENT

at the

CAMP ASHLAND - MEAD

for the

MILITARY DEPARTMENT
STATE of NEBRASKA
Lincoln, Nebraska

PROJECT NO. 311090419

ADDENDUM NO. 1

The original specifications and drawings on the STATE OF NEBRASKA REQUEST for PROPOSAL FORM for the project noted above are amended as noted in this Addendum No. 1.

Receipt of this Addendum shall be acknowledged by inserting its number and date in the space provided on the Bid Form.

ADDENDUM NO. 1

NOTE TO ALL PLANHOLDERS: Please insert this Addendum into your copy of the Contract Documents for the above named project.

The following changes to the Contract Documents are issued by the CFMO-CMB and shall have the same force and affect as though a part of the original issue.

THE RECIEPT DATE, TIME and LOCATION of the BID PROPOSAL submission HAS NOT CHANGED.

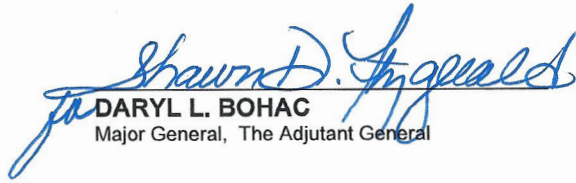
Project Manual

ITEM NO.

- ADD 1-1 See attached Sign-In sheet from Pre-Bid Conference held on 27 July, 2017 at the site.
- ADD 1-2 See attached Pre-Bid Conference meeting minutes for meeting held on 27 July, 2017 at the site.



THIS ADDENDUM SHALL BE ATTACHED TO AND MADE A PART OF THE DRAWINGS AND SPECIFICATIONS AND SHALL BE ACKNOWLEDGED WITH THE BIDDER'S PROPOSAL.


DARYL L. BOHAC
Major General, The Adjutant General

End of Addendum No. 1



PRE-BID CONFERENCE
CATS Entrance Paving Sustainment
Camp Ashland

0930 hrs & 27 July 2017

INTRODUCTORY REMARKS:

The Purpose of this conference is to answer any Administrative or Technical questions you may have and to provide you with an opportunity to look at the Project Site.

INTRODUCTIONS – I'd like to make some Introductions:

MSG David Nanfito - Facility Point of Contact 402-309-7250

David Egr - CFMO Project Manager 402-309-8462

Matthew Shimerdla - Schemmer Architects - Project Architect 402-488-2500

Keith Brocksmith - CFMO Contracts Officer 402-309-8473

SIGN IN SHEET– Has everyone had a chance to sign the Sign In Sheets that are circulating? Be sure and sign in before you leave.

ADDENDUMS

Everyone receiving Plans and Specs and or attending the Pre-Bid Meeting will receive any addendums issued.

List of addendum's already issued on project: None

Dead-line for clarification of Plans & Specifications that may require an Addendum needs to be submitted to the A&E by Noon Thursday 3 August.

BID FORM

On completing the Bid Proposal Form contained in the Bid Packet (Section P1 of 4):

1. Please fill out the Bid form completely for all applicable items.
2. Sign the Bid Form in Blue Ink. Bids received without original signature or signed in pencil will not be accepted.

3. Return all (4) pages of the Bid Form, pages P1 – P4.
4. Include Bid Security of 5% of the total Bid Amount on the project.
5. On the Bid Form, there is a Total Base Bid Amount and no Alternative Bid Items (ABI) on this project.
6. Be sure to enter your Bid Proposal amounts correctly in both words and figures as required on the Bid Proposal Form. The Bid Review Committee will review the Bids for any discrepancies.
7. In the case of an irregularity between the numeric amount and the written amount below, the amount written shall govern.

BID SECURITY

The bid proposal “must” be accompanied by a Bid Bond in the amount of 5% in order to be considered from a:

1. Bonding Company (AIA Document A310 American Institute of Architects)
2. Cashier’s Check or;
3. Money Order (in that order of preference)

BIDS DUE

1. The Bids are due **NO LATER THAN @** 1330 hours on 10 August 2017 at the Construction & Facilities Management Office, 3rd Floor Conference Room in the Joint Forces Headquarters Building at the Lincoln Air National Guard Base by the Lincoln Airport.
2. Please note that this Bid Opening in the “new” Joint Forces Headquarters Building on the Air Guard Base. You need to be aware of possible problems that you may encounter trying to enter the Base.
 - a. All vehicles entering the Base will be stopped at the Front Gate and asked to show a Drivers License Photo ID and asked the reason or business for entry.
 - b. Your answer should be: You are from XYZ Construction Company delivering a Construction Bid for the “CATS Entrance Paving Proj. ” to Keith Brocksmith at the Construction and Facilities Management Office at the Joint Forces Headquarters Building and will be attending the Bid Opening.
 - c. In advance of the Bid Opening, we will notify Base Security of the Bid Opening and provide them with a copy of today’s Sign-In Sheet to expedite this process.
 - d. Importantly, constructors will need to allow a lot more time to deliver Bids versus than in the past when CFMO Contracting was on Military Road. Are there any questions on this?

3. Hand-carried bids must be delivered no later than 1:30 p.m. to Mr. Keith Brocksmith or Mrs. Mary Rodriguez (Administrative Assistant). If you hand carry your bid, call Keith by noon to be put on the visitor access listing, and be sure and allow adequate time to clear through the Security and find our Office.
4. There is guest parking available in front of the Joint Forces Headquarters Building. If you are have difficulty getting into the Air Guard Base, please call me at 402-309-8473 or have the Front Gate Guard call Mrs. Mary Rodriguez at 402-309-8450 or Mr. Robert DeMoss at 402-309-8464.

The Bids will be publicly opened and recorded in the 3rd Floor Conference Room

You are welcome to stay and attend the Bid Opening.

DRUG POLICY

By signing the Invitation to Bid, the Bidder is committed to provide a drug free work place environment. If requested by the Military Department, the Bidder must furnish evidence that they have a Drug Free Workplace Policy.

BID REVIEW COMMITTEE

The "Bid Review Committee" will meet within one week after the Public Bid Opening to review the bids for any irregularities and to award the contract on the Project.

CONTRACT REVIEW

Contracts will be prepared and sent to the Contractor for signature. The contracts will be sent to the State Attorney General's Office for Review. The Attorney General Review takes about two weeks. The contract is then signed by the Adjutant General or his designee.

LIQUIDATED DAMAGES

No liquidated damages will be assessed for this project.

DAVIS BACON ACT

DAVIS BACON does not apply to this Project under Nebraska State Contracting Procedures.

PERFORMANCE BONDS

If awarded the Contract - Performance Bonds and Labor & Material Bonds are required on this Project.

MANDATORY MEETINGS

After the Contract is fully executed, a PRE-CONSTRUCTION MEETING will be held at the Camp Ashland Bldg 22 or 23 after the Contracts, Performance Bonds, and

Certificate of Insurance have been received.

INVOICE PAYMENTS ON PROJECT

1. Payments will be made by DIRECT DEPOSIT on the project in accordance with State of Nebraska procedures. Payments will be made within 45 days after the invoices are received at the CFMO Office.
2. The Nebraska State Treasurer requires that payments in excess of \$25,000 will be made by direct deposit instead of State Warrants (checks).
3. The Contractor must establish a direct deposit payments enrollment with the State Treasury (ACH – Automated Clearing House). The enrollment form will be provided at the Pre-Construction Meeting.

HOURS OF OPERATION AT THE PROJECT LOCATION:

Typically Monday - Friday, 0730-1630 hours, however this project could be Dawn to Dusk - 7 days a week at contractor's discretion.

The Contractor will work within this timeframe unless different hours are worked out with the Facility "Point of Contact."

COORDINATION ON OTHER CONSTRUCTION AT CAMP ASHLAND

Mr. Dave Egr ,the CFMO Project Manager, will provide coordination between the Contractor on this Project and other construction projects in the immediate area.

Current Projects: None

EQUIPMENT STORAGE & MATERIAL STORAGE AT THE SITE

The Contractor is responsible for the security of their equipment and any materials left at the site.

The Contractor is expected to keep the construction site clean and free of trash and debris during the project. Daily cleaning shall be completed.

USE OF SANITARY FACILITIES:

Contractor will be required to supply & maintain chemical toilets during project execution.

SECURITY

In accordance with PROJECT SECURITY REQUIREMENTS on Attachment 0800 under Supplementary Conditions of the Bid Packet, Contractors (and all sub-contractors) are required to provide security information at least one week in advance of beginning work: Information to be filled out on EAL form.

1. Names of their Employees that will be working at the site

2. Employee Driver's License number and State of issue

ADMIN QUESTIONS

Entry Authorization Lists, if required, will be done electronically and primary POC is Keith Brocksmith.

- When submitting pay documents to the A&E for review, send a second copy to the Project Manager, Dave Egr so that he has a heads up to watch for the incoming document.
- Change Orders (CO) - Please annotate and request as early as possible to avoid construction delays. CO's should not be completed or billed until contractor receives an approved CO form from the Contracts Officer, Keith Brocksmith.

CFMO PROJECT MANAGER COMMENTS

CONTRACT TIME

1. Contractor is to ensure days indicated on bid form are correct and realistic. The days should reflect the time required from issuance of "Notice To Proceed" thru Substantial Completion of the project.
2. If the Bid form will indicate a not to exceed date, that is the maximum amount of time we have allotted for the project. Your number of days can be less just not more than that timeline.

GENERAL CONDITIONS REVIEW

See General Conditions provided in the bid packet.

SUBMITTAL SCHEDULE

The construction schedule is utilized by the CFMO to manage the progress and timeliness of project submittals, inspections, and sample requirements. The successful offeror will be handed the schedule at pre-construction to complete. All items will be listed on the schedule for which is required. Contractor will be responsible for inserting the dates that each item will be submitted. Once complete it will be loaded into submittal exchange for reference. See page 3 of the sample contract in the Plan Book.

USE OF SITE

The Contractor is responsible for the security and safety of the site at all times. The construction area should be kept tidy, and adjacent space and roads to be kept clean and clear. Contractor responsible for repair of any damages to facilities and property.

SECURITY REQUIREMENTS

Taking photos of government vehicles and personnel, or gate area is not authorized.

Sensitive areas within the construction site:

NON STANDARD CONSTRUCTION ITEMS AND/OR SPECIFIC CONTRACTOR OR MANUFACTURER COORDINATIONS

List non standard items and coordinations.

PROJECT ALLOWANCES

List all allowances

ALTERNATIVE/ADDITIVE BID ITEMS

ABI #1: None.

FACILITY POC COMMENTS

The normal duty hours are from 0730 to 1630 hrs. IF you foresee a need to work extended hours, please give me or my counterpart a heads up a day or two in advance so that I can make arrangements.

ARCHITECT COMMENTS

Pay close attention to close-out documentation, and warranty submissions. Warranty shall not start at the date of manufacture or installation. Warranty will begin at project completion and turned over to the NEANG. Submittals go to Matt Shimerdla for processing, verification and approval. 3 sets of close-out documentation (binders) will be required prior to final payment. These will be sent to the Architect for his review along with the As-built drawings. Reminder of the Clarification of Plans & Specifications is stated on Page 1 of these Conference Notes.

CONTRACTOR QUESTIONS AND COMMENTS

-- Where are the asphalt milling products being transported to? -- The millings are to be transported to a site on Area E of Camp Ashland (see attached map in Addendum 1) which is 5 miles away from the work site (10 miles round trip).

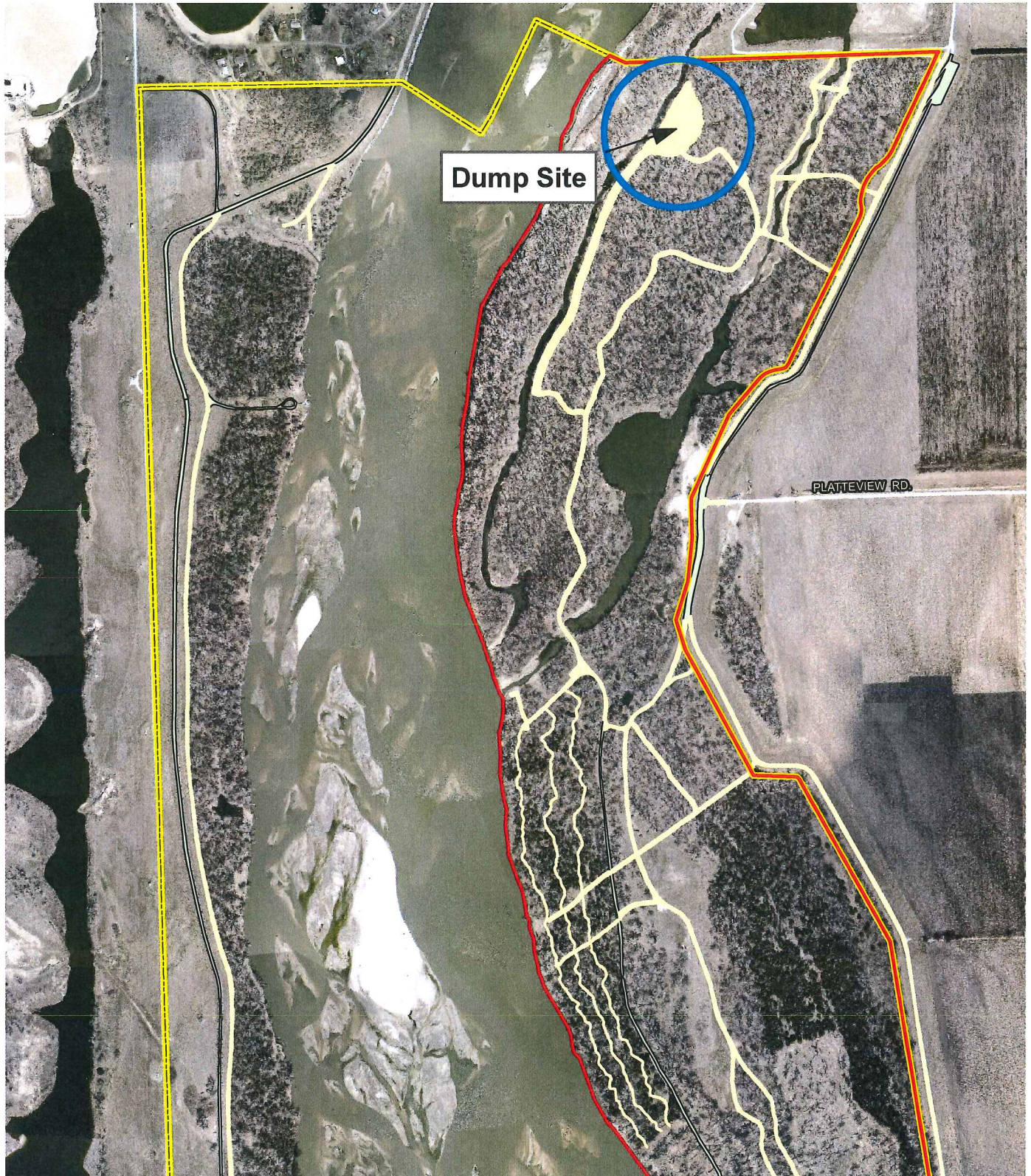
-- Any testing of the asphalt products required? --Yes, see addendum 1 for specifications.




MEETING ADJORNED:

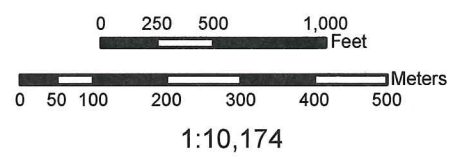
PROJECT SITE EXAMINATION

-- Was not done since, everyone drove in on the current surface and no one had an additional need for further examination.

Camp Ashland Training Site Area E



-  Bivouac Locations
-  Installation Boundary
-  Roads/Trails



Projection: UTM, Zone 14N
Datum: WGS 1984
Source: Pictometry, 2013
Date: 20140528
Prepared By: CFMO-EMB
20140528_area-e_milgrid_8.5x11



**SPECIAL PROVISIONS
CAMP ASHLAND CANTONMENT ROADS
ENTRANCE ROAD CONSTRUCTION
JOB NUMBER 31090424**

TABLE OF CONTENTS

Modification to NDOR Standard Specifications	2
Pre-Bid Meeting	3
Limitations of the Work	3
Status of Utilities.....	6
Status of Right of Way	6
Special Prosecution and Progress.....	7
Subletting or Assigning the Contract	7
Special Events	8
Phasing.....	8
Dust Control	8
Migratory Bird.....	8
Construction Details.....	9
Mobilization	9
Traffic Control	10
Construction Progress Schedules.....	10
Quality Control Testing & Construction Staking	10
Warranty.....	11
Milling	11
Asphalt Base Repair.....	11
Crack Sealing Bituminous Surface.....	12
Fog Seal	12
Asphaltic Concrete Pavement.....	13
NDOR Section 1028 - Superpave Asphaltic Concrete (Urban).....	15
NDOR Performance Graded Binder Special Provision	33

MODIFICATIONS TO NDOR STANDARD SPECIFICATIONS
SUPPLEMENTARY CONDITIONS

SC-1 SCOPE. The Supplementary Conditions amend or supplement the 2007 Edition of the Standard Specifications for Highway Construction by the Nebraska Department of Roads and other provisions of the Contract Documents. All provisions not so amended or modified remain in full force and effect.

SC-2 MODIFICATIONS, ADDITIONS, AND ELABORATIONS TO THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION. Where explicitly indicated in the paragraph SC-2, changes shall be made to the referenced Standard Specifications for Highway Construction articles. Additional information which supplements rather than changes the Standard Specifications for Highway Construction articles is also included in this paragraph SC-2.

SC-2.01 SECTION 101-GENERAL INFORMATION, DEFINITIONS, AND TERMS. The following information is applicable to Section 101. The terms used in these Supplementary Conditions which are defined in the Standard Specifications for Highway Construction have the meanings assigned to them in the Standard Specifications for Highway Construction, unless a modification of that definition is made herein.

SC-2.01.01 Definition Additions. The terms defined below shall be added to the list of definitions.

101.0402 – “Owner” – The State of Nebraska.

101.0401 – “Consulting Engineer” – The firm of Schemmer Associates

SC-2.02 SECTION 107-LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC.

SC-2.02.01 Add the following as paragraph 12 under Article 107.07-Public Convenience and Safety.

12. Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to all persons and the Work site or who may be affected by the Work; all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and underground facilities not designated for removal, relocation or replacement in the course of the Work. Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage,

injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of underground facilities and utility owners when prosecution, removal, relocation and replacement of their property. All damage, injury or loss to any property caused directly or indirectly, in whole or part, by Contractor, any Subcontractor, Supplier, or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by Contractor. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and accepted.

SC-2.02.02 Make the following revisions to Article 107.12-Responsibility for Damage, Injury, or Other Claims.

Paragraph 1. Add the Owner and the Consulting Engineer as additional parties that the Contractor shall indemnify and save harmless under the provisions of this paragraph.

GENERAL CONDITIONS

PRE-BID MEETING

A pre-bid meeting is scheduled for July 27, 2017 at 9:30am at the Camp Ashland Training Site, Building 50. Following the meeting, a site visit will be conducted to allow prospective bidders the opportunity to review the project site.

LIMITATIONS OF THE WORK

A. General

The Contractor will be permitted to use available pavement belonging to the Owner, on or near the site of the work, for construction purposes and for the storage of materials and equipment. The location and extent of the areas so used shall be designated by the Owner. The Owner shall approve all materials to be stored on site prior to their delivery. No materials or equipment may be placed upon the property of the Owner until the Owner has agreed to the location contemplated by the Contractor to be used for storage.

It shall be understood that the responsibility for protection and safekeeping of equipment and materials on or near the site shall be entirely that of the Contractor and that no claims shall be made against the Owner by reason of any act of an employee or trespasser. It shall be further understood that should any occasion arise necessitating access to the sites occupied by these stored materials and equipment, the Contractor owning or responsible for the stored materials or equipment shall immediately move same.

The Contractor shall be solely responsible for obtaining and shall pay all costs in connection with any additional work area, storage site, access to the site, or temporary right-of-way which may be required for proper completion of the work.

B. PERMITS

Because of the nature of the work, permits for the work were not deemed necessary. The Contractor is expected to follow industry standard practices and protocols regarding performance of the work and protection of the area surrounding the designated work areas.

Construction stormwater management control measures for Contractor obtained construction work areas located outside the right-of-way, such as borrow pit operations, haul roads, plant sites, staging areas, equipment storage sites, etc. are the sole responsibility of the Contractor. All construction stormwater management control measures for these areas are at the Contractor's expense. The Contractor is responsible for securing all required permits for use of these areas.

C. EASEMENTS AND RIGHTS-OF-WAY

The easements and rights-of-way for the construction will be provided by the Owner. The Contractor shall confine his construction operations within the limits given and shall use due care in placing construction tools, equipment, excavated materials, and construction materials and supplies, so as to cause the least possible damage to property and interference with traffic and daily operations.

D. OPERATION OF EXISTING FACILITIES

Existing sewer facilities shall be kept in continuous operation throughout the construction period. No interruption will be permitted which adversely affects the degree of service provided. Interruptions in water service shall be kept to an absolute minimum. The Contractor shall provide temporary facilities and make temporary modifications as necessary to keep the existing facilities in continuous operation during the construction period. Contractor shall not operate existing valves, hydrants, or other facilities belonging to the Owner without obtaining prior written permission from the Owner.

E. NOTICES TO OWNERS AND AUTHORITIES

The Engineer will provide a general notice of upcoming construction to affected parties and emergency responders prior to the start of construction. When it is necessary to temporarily deny access by owners or tenants to their property, or when any utility service connection must be interrupted, beyond those identified in the plans, the Contractor shall give notices sufficiently in advance to enable the affected persons to provide for their needs. Notices will conform to any applicable local ordinance and, whether delivered orally or in writing, will include appropriate information concerning the interruption and instructions on how to limit their inconvenience.

F. UNFAVORABLE CONSTRUCTION CONDITIONS

During unfavorable weather, wet ground, or other unsuitable construction conditions, the Contractor shall confine his operations to work which will not be affected adversely by such conditions. No portion of the work shall be constructed under conditions which would affect adversely the quality or efficiency thereof, unless special means or precautions are taken by the Contractor to perform the work in a proper and satisfactory manner.

Work to be performed may require pumping and dewatering to complete the work as specified and as indicated on the drawings. It is the intent of these specifications that such pumping and dewatering operations shall be the obligation of the Contractor.

G. CLEANING UP

The Contractor shall keep the premises free at all times from accumulations of waste materials and rubbish. No stockpiling of removals, millings, or other materials to be disposed of will be allowed overnight. The Contractor shall promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solutions from surfaces to prevent marring or other damage. Volatile wastes shall be properly stored in covered metal containers and removed daily. Wastes shall not be buried or burned on the site or disposed of into streams or waterways. All wastes shall be removed from the site and disposed of in a manner complying with local ordinances and antipollution laws. Adequate cleanup will be a condition for recommendation of progress payment applications.

H. SITE ADMINISTRATION

The Contractor shall be responsible for all areas of the site used by him and by all his Subcontractors in the performance of the work and shall exert full control over the actions of all employees and other persons with respect to the use and preservation of property and existing facilities, except such controls as may be specifically reserved to the Owner or others. The Contractor has the right to exclude from the site all persons who have no purpose related to the work or its inspection, and may require all persons on the site (except the Owner's employees) to observe the same regulations as is requires of the Contractor or Subcontractor(s) employees.

I. OFF-SITE STORAGE

Off-site storage arrangements shall be acceptable to Owner for all materials and equipment not incorporated into the work but included in Applications for Payment. Such off-site storage arrangements shall be presented in writing, and shall afford adequate and satisfactory security and protection. Off-site storage facilities shall be accessible to Engineer and Owner.

J. SAFETY

The Contractor shall at all times comply with all applicable laws and regulations including OSHA regulations to make certain the Contractor's employees, everyone working at the job site, and members of the public are not exposed to hazards. High

voltage, uninsulated overhead power lines are located in close proximity to this project. Any conducting object which approaches the power lines may transfer electricity which could cause serious injury or death. The Contractor shall not allow any object to approach a power line within ten feet without first contacting the Owner. The Contractor shall inform all of his employees of this requirement, and the possible hazards regarding working around the overhead power lines. No earth fill or any other material shall be placed near an overhead power line so as to reduce clearances to less than required by the National Electrical Safety Code.

K. TREE AND PLANT PROTECTION

No trees or cultured plants shall be damaged or unnecessarily removed unless their removal is indicated on the drawings. All trees and plants not removed shall be protected against injury from construction operations. Contractor shall take extra measures to protect trees designated to be preserved, such as erecting barricades, trimming to prevent damage from construction equipment, and installing pipe and other Work by means of hand excavation or tunneling methods. Such trees shall not be endangered by stockpiling excavated material or storing equipment against the trunk.

When the injury or removal of trees designated to be preserved cannot be avoided, or when removal and replacement are indicated on the drawings, each tree injured beyond repair or removed shall be replaced with a similar tree of the nearest size possible. All trimming, repair, and replacement of trees and plants shall be performed by qualified nurserymen or horticulturists.

STATUS OF UTILITIES

Utility facilities, aerial and/or underground may exist within this project. The Contractor shall use a private utility locator approved to work on site to determine to his/her satisfaction the extent of utility occupancy and utility conflict for facilities located within the construction areas. At this time, no utilities have been required to relocate their facilities. Any utility adjustments or interruption of service for the convenience of the Contractor shall be the sole responsibility of the Contractor. The cost to locate utilities within the construction area shall be subsidiary to items for which direct payment is made.

Any relocation work necessary will be concurrent with construction.

STATUS OF RIGHT OF WAY

The Owner anticipates securing all necessary Right of Way, Easements, or Right of Entry prior to receipt of bids. No work will be allowed outside the existing Right of Way until the necessary access or ownership paperwork is complete. Work within the Right of Way will be allowed upon execution of the Contract.

SPECIAL PROSECUTION AND PROGRESS

A. DEFINITION OF TERMS

Calendar days are defined in the NDOR *Standard Specifications for Highway Construction*, 2007 or later Editions including all Addenda

B. CRITICAL MILESTONES

The Tentative Start Date for the project is September 7, 2017. Measurement of "Calendar Days" for completion of the work outlined in the contract documents shall begin on the start date of this project identified above. The contractor shall determine the date for substantial completion of work activities and open to vehicular traffic. Substantial completion shall be defined as constructing a 6" pavement base 4' wide next to the existing roadway, having all identified roads milled to a nominal 2" depth and resurfacing the entire roadway width using an NDOR Asphalt mix to the identified plan depth.

SHOP DRAWINGS

The Contractor shall submit shop drawings for approval, as necessary, for all construction materials specified by the contract documents.

SUBLETTING OR ASSIGNING THE CONTRACT

Subsection 108.01 in the Standard Specifications is void and superseded by the following:

108.1 – Subletting or Assigning of Contract

1. a. (1) The Contractor will not be allowed to sublet, assign, sell, transfer, or otherwise dispose of any portion of the contract or any right, title, or interest therein; or to either legally or equitably assign any of the money payable under the contract or the claims without the prior written consent of the Engineer.
- (2) With the Engineer's consent, the Contractor may sublet up to 70 percent of the work.
- (3) Any items designated in the contract as "specialty items" may be performed by subcontract.
- (4) The cost of any subcontracted "specialty items" may be deducted from the total contract cost before computing the percentage of work required to be performed by the Contractor.

- (5) Subcontracts, or transfer of contract, will not release the Contractor of any liability under the contract and bonds.
- b. Certain items of work may be performed without a subcontract. A list of items not requiring a subcontract is available from the Engineer.

SPECIAL EVENTS

Special Events for this project include days in which no work activity can take place in or around Camp Ashland due to conflicts with activities planned for the base. Coordination with staff from the Nebraska National Guard will need to be ongoing during construction to ensure there are no conflicts between the contractor and base personnel. The contractor will be notified in advance if there is a conflict on or near the base that would result in the contractor not allowed to continue construction activities.

PHASING

The construction phasing plan has been provided to the contractor to consider in scheduling construction activities. The project area can be closed to all traffic as long as access is provided to Camp Ashland through the entrance gate and a clear detour route is signed. It is the intent of the Contract Documents for the Contractor be solely responsible for all planning and coordination of construction activities, including those relating to phasing of project construction. Alternate construction phasing plans which are deemed better suited to completion of the work by the Contractor shall be submitted to Engineer for review.

DUST CONTROL

The Contractor shall be responsible for dust and construction debris resulting from the performance of the various operations (i.e. removals, milling/surface planing, grading, etc.). If excess dust or construction debris present on the roadway facility result in reduced visibility or unsafe driving conditions as determined by the Contractor, Owner, or Engineer, the Contractor shall cease operations until the situation is corrected.

MIGRATORY BIRD

Clearing and grubbing of any identified trees will be allowed prior to the primary nesting season and prior to the issuance of the project Notice to Proceed when requested in writing by the Contractor. The primary nesting season in Nebraska has been determined to generally occur between April 1 and September 1. These nesting dates are a guide only, nesting can occur outside of those dates. Work outside of those dates is not exempt from compliance with the Migratory Bird Treaty Act.

The Contractor shall, to the extent possible, schedule clearing and grubbing activities to occur outside the primary nesting season in Nebraska if possible. However, if circumstances dictate that project construction or demolition must be done when nesting migratory birds may be present, a survey of the number of active nests and species of birds shall be conducted by a qualified bird surveyor provided by the Owner and a representative of the Contractor. If the survey finds that nests will be impacted by the proposed construction, delays may occur requiring adjustment of the phasing, project schedule, or daily production to comply with the Migratory Bird Treaty Act and meet the desired completion date.

If an active nest is found during the survey, the Contractor should do everything possible to restructure his activities and leave the nest undisturbed until the young fledge. Fledging could occur within a week, or up to a month, after the survey depending on the species of bird and whether the nest contained eggs or young. Also depending on the species of bird and their sensitivity to disturbance, a buffer of up to 30 feet surrounding the tree with the active nest could be required. If construction operations result in unavoidable conflict with nesting migratory bird's eggs or young, which will result in "taking" nests and their contents, the Contractor should notify the Engineer as soon as practicable. If construction cannot be rescheduled to allow the birds to fledge, and it is determined as an unavoidable "take" circumstance, the Contractor shall stop all work within 30 feet of the active nest and coordinate with the Engineer to determine how to proceed. The Engineer will facilitate coordination with the US Fish and Wildlife Service to determine the appropriate way to address the active nest. No work shall occur within 30 feet of the active nest until US Fish and Wildlife Service coordination is complete and the requirements of the Migratory Bird Treaty Act are satisfied.

Once a bird survey is conducted, it is the Contractor's responsibility to use any legal and practical method to prevent the nesting of birds in order to prevent the need for additional surveys. The Contractor shall schedule his/her work to accommodate the process of conducting a survey(s) and remove cleared trees as soon as practicable. It is understood and agreed that the Contractor has considered in the bid all of the pertinent requirements concerning migratory birds (including endangered species) and that no additional compensation, other than time extensions if warranted, will be allowed for any delays or inconvenience resulting in these requirements.

CONSTRUCTION DETAILS

1) MOBILIZATION

Mobilization shall be measured and paid as a Lump Sum per bid grouping as indicated in the Contract Documents. The price shall represent all work, labor, materials and related items necessary to plan, acquire, provide, prepare, deliver, and/or remove all materials, equipment, barricades and personnel required to accomplish the work.

MOBILIZATION SHALL NOT EXCEED 10% OF THE SUM OF ALL OTHER BID ITEMS COMBINED.

2) TRAFFIC CONTROL

The Contractor is responsible for providing and maintaining a MUTCD-compliant workzone traffic control. All barricades, signs, lights, and other protective devices shall be furnished, installed, maintained and removed by the Contractor in conformity with the provisions of Section 422 in the Standard Specifications. The Contractor shall be solely responsible for the adequacy of safety measures and for compliance with safety regulations and statutes. All barricades and obstructions shall be illuminated with warning lights from sunset to sunrise. Material storage and conduct of the work on or alongside public streets and highways shall cause the minimum obstruction and inconvenience to the traveling public.

All open trenches, pavement removals, and other excavations shall have suitable barricades, signs, and lights to provide adequate protection to the public. Obstructions such as material piles and equipment shall be provided with similar warning signs and lights.

Traffic control shall be measured and paid as a Lump Sum per bid grouping as indicated in the Contract Documents. The price shall represent all work, labor, materials and related items necessary to provide, install, shift, maintain, and remove all barricades, signs, lights, and other workzone protective devices. Flagging operations, as needed, shall be subsidiary to traffic control item.

3) CONSTRUCTION PROGRESS SCHEDULES

Before work is started, the Contractor shall prepare a detailed schedule of all construction operations indicating the sequence of the work, the time of starting and completion of each part, and the installation dates for major items of equipment. The schedule shall be submitted to the Owner for review within 15 days after executing the Owner-Contractor Agreement. The schedule shall be revised and resubmitted as required by the Owner or Engineer.

4) QUALITY CONTROL TESTING & CONSTRUCTION STAKING

The Contractor shall be responsible to monitor quality control over suppliers, manufacturers, production processes, products, services, site conditions, and workmanship, to produce Work of specified quality. It is expected all work will comply with the manufacturers' instructions. Should the manufacturers' instructions conflict with the Contract Documents, request clarification from Engineer before proceeding with the work.

The Contractor will appoint and employ services of a firm or firms to perform construction staking and materials acceptance testing. Reports will be submitted by the testing firm to the Engineer and Contractor, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents. Testing does not relieve Contractor to perform Work to contract requirements. Re-testing required because of non-conformance to specified requirements shall be performed by the same testing firm on

instructions by the Engineer. Payment for re-testing will be charged to the Contractor by deducting testing charges from the Contract Sum/Price.

Notify the Engineer 1 business day prior to the expected time for operations requiring testing services. Notify the Engineer 3 business days prior to the expected time for operations requiring construction staking services.

5) WARRANTY

Contractor shall warranty all work performed to be free of defect due to materials, workmanship, or other factors under the control of the Contractor for a period of one (1) year commencing upon the date of final acceptance.

6) MILLING

Milling shall be performed in accordance with Section 510.

The milling depth shall be a nominal average depth of two (2) inches in all areas unless otherwise directed by the Engineer. Milling shall provide for a uniform milled surface and positive drainage when carrying traffic. Milling is anticipated to vary from 1.25" to 3". Millings shall become the property of the Contractor.

7) ASPHALT BASE REPAIR

Asphalt base repair shall be performed in accordance with Section 516.

The minimum asphalt thickness for Asphalt Base Repair shall be 6". All base repair shall be compacted with a self-propelled roller able to achieve the minimum compaction requirements specified in the Contract Documents. The minimum width of a base repair shall be equal to or greater than the width of the narrowest self-propelled roller supplied.

Asphalt Base Repair shall be measured and paid for by the ton of asphalt base repair accepted. It shall include all materials, labor, equipment, sawing and removal of existing pavement, preparation of existing pavement or subbase, partial and full depth patches, hauling and approved disposal of existing pavement to complete pavement repairs.

8) CRACK SEALING BITUMINOUS SURFACING

Crack Sealing Bituminous Surfacing shall be performed in accordance with Section 519 except as modified as follows.

9) FOG SEAL

Subsection 513.02 is void and superseded by the following:

Fog seal shall be of the type and grade shown in the plans, and asphalt shall conform to the requirements of Subsections 1031.01 or 1032.01. The Fog Seal emulsion shall be SS-1H, CSS-1H, CFS-1 or FS-1.

Section 513 of the Standard Specifications is amended to include the following:

1. The rate of dilution of the emulsified asphalt will be 1 part water to 1 part emulsified asphalt. The percentage residue by distillation of the diluted emulsified asphalt shall be no less than 28.5%.
2. The emulsified asphalt shall be diluted in the field under the supervision of the Engineer or at the terminal. If the emulsified asphalt is diluted at the terminal:
 - a. the bill of lading or delivery ticket shall state the dilution rate, and
 - b. a one-quart field sample may be requested by the NDOR Bituminous Laboratory. This sample shall be submitted to the NDOR Bituminous Laboratory to verify the requirements of Subsections 1031.01 and 1032.01, with the exceptions of Saybolt Furol Viscosity, Storage Stability and Cement Mixing.
3. The rate of application shall be approximately 0.12 gallons per square yard. The Engineer may adjust this rate as a result of the test strip or field results.
4. Excess accumulations of fog seal materials within low spots or pockets shall be squeegeed out or sand blotted.

Paragraph 2. of Subsection 513.05 in the Standard Specifications is void and superseded by the following:

2. When materials do not meet plan and specification requirements, deductions will be made according to Table 513.01.

Section 513 is amended to include the following Table:

Table 513.01

<p style="text-align: center;">Emulsion Pay Factor Schedule</p> <p style="text-align: center;">Test of Residue Percentage</p> <p style="text-align: center;">1.00 for a deviation of minus less than or equal to 0.5 % 0.75 for deviation of minus greater than 0.5 % to less than or equal to 2.5 % 0.40 or Reject for deviation of minus greater than 2.5%</p> <p style="text-align: center;">Tests for ALL other properties Specified</p> <p style="text-align: center;">1.00 for a deviation of \pm less than or equal to 10% 0.75 for a deviation of \pm greater than 10% to less than or equal to 25% 0.40 or Reject for deviation of \pm greater than 25%</p> <p>Note Largest Pay Factor Reduction will be applied.</p>

- a. When disputes arise in test results, the NDOR will select an independent laboratory for referee testing on the remainder of the sample. The identity of the independent laboratory will not be revealed until the selected laboratory has completed the referee testing.
- b. Only the contractor can initiate dispute resolution, and request referee testing.
- c. Only referee testing results obtained within 14 days of sampling will be valid.
- d. If the independent lab's tests indicate failing results and pay deductions equal to or greater than the NDOR's, the contractor will reimburse the NDOR for the cost of testing. If the independent lab's tests indicate that the material meets specifications or is at a pay deduction less than the NDOR's, the NDOR will assume the cost of testing. When the independent lab's tests indicate a pay deduction, the lesser of the NDOR's and the independent lab's deductions will be applied.

10) ASPHALTIC CONCRETE PAVEMENT

Asphaltic Concrete Pavement shall be performed in accordance with the 2007 NDOR Standard Specifications and supplemental provisions NDOR Section 1028 - Superpave Asphaltic Concrete (Urban) contained herein.

In the event of a conflict between the Contract Document and the following chart, the following chart requirements shall prevail.

Mix Type/Designation (Modified NDOR Designations)		SPR
Asphalt Material Properties	RAP, % By Total Wt. Of Mix⁴	35 max.
	Coarse Aggregate Crushed Particle (NDOR T586 ¹)	Min. 83 %
	Uncompacted Void Content Of Fine Aggregate, AASHTO T304³	43.0% min.
	Flat And Elongated Pieces (5:1 Ratio)	10% max.
	Sand Equivalent	45 min.
	Dust To Effective Binder Ratio	0.7 - 1.7
	Mix Design Air Voids, %	Target 4.0
	Compaction Gyration Ninitial	7
	Compaction Gyration Ndesign	65
	Compaction Gyration Nmaximum	100
	Minimum Production Binder Content (% of Total Mix)	5.0 min.
	Production Air Voids, %	2.0 – 4.0
	In-Place Compaction (% of Gmm)	92.4 min.

1. Coarse aggregate angularity individual test tolerance during production -5% below min.
2. "85/80" denotes that 85% of the coarse aggregate has one or more fractured faces and 80% has two or more fractured faces
3. Fine aggregate angularity individual test tolerance during production -0.5% below minimum
4. Recycled Asphalt Pavement (RAP) must be from a certified or controlled source acceptable to the Engineer and shall be approved prior to use in the asphalt mix

All HMA mixes containing at least eighty percent (80%) limestone by weight of virgin material will not be required to utilize hydrated lime or other anti-stripping agents provided the mix meets the specified TSR requirements. The Engineer reserves the right to request random periodic TSR tests. In the event a failing TSR test is reported, production shall be halted and a new Job Mix Formula shall be submitted by the Contractor with the necessary hydrated lime or anti-stripping agents included.

The Contractor or Supplier shall provide PG graded binder certified quality control test results for each asphalt binder supplier utilized. Samples shall be randomly sampled from the production supply line during actual production of asphalt for use on this Contract. The Engineer shall be notified prior to obtaining samples.

All RAP incorporated into the project shall come from a documented RAP Source. Prior to production, the Contractor shall submit representative sampling test results showing gradation, AC content, and component aggregate classification or source for all proposed RAP sources for review by the Engineer. The Contractor shall notify the Engineer prior to changing RAP sources and test results must be submitted and approved in writing.

The Contractor shall provide quality control test results for every lot of asphalt material produced for each certified RAP source being used. Samples shall be randomly sampled from the stockpile or material conveyance belt during actual production of asphalt for use on this Contract as directed by the Engineer. The Contractor shall obtain two (2) separate samples of at least twenty (20) pounds at the same time and provide one (1) to the Engineer to be used for Quality Assurance verification testing at the Engineer's discretion.

If the ambient air temperature is anticipated to be at or below fifty-five degrees (55° F) Fahrenheit during production or placement of the asphalt, the Contractor shall utilize PG Binder containing Evotherm, or an approved equivalent by the Engineer, added at 0.7% by weight of binder to the mix. The Contractor shall notify the Engineer if the manufacturer's recommended dosing for Evotherm or the approved equivalent is different than the prescribed amount to allow for consideration in modifying this dosing requirement.

Unacceptable material tests or construction shall be subject to removal and replacement or shall be subject to a pay factor adjustment as defined herein or as directed by the Engineer.

Disincentive calculations shall be in accordance with the Special Provisions except as modified herein. Disincentives shall be calculated in compounding fashion if multiple disincentives occur on the same subplot or lot similar to current NDOR calculation methods.

The maximum payment for asphaltic concrete, accepted by the Engineer, and measured as provided herein shall be equal to the total number of tons constructed and accepted multiplied by the Contract unit price per ton for the type of Urban Superpave Asphaltic Concrete specified.

Evotherm, or an approved equivalent, will not be measured and paid for directly but shall be considered subsidiary to items for which the Contract provides direct payment.

The Engineer shall measure asphaltic concrete for pavement repair for payment by the "TON" of the type of asphaltic concrete placed, compacted, and accepted. Any additional area outside of the identified base repair area necessary to remove for the contractor's equipment or damaged due to the Contractor's efforts shall not be considered eligible for payment. Payment for base repair performed with ACP materials shall be under the pay item for "Asphaltic Concrete for Pavement Repair".

11) NDOR SECTION 1028 - SUPERPAVE ASPHALTIC CONCRETE (URBAN) (J-7-0213)

Section 1028 in the Standard Specifications is void and superseded by the following:

1028.01 -- Description

1.
 - a. Superpave Asphaltic Concrete is a Contractor-designed mix.
 - b. The Contractor shall be required to define properties using a gyratory compactor that has met the Superpave evaluation test procedures, during mix design and production.
2. Job Mix Formula
 - a. Before production of asphaltic concrete, the Contractor shall submit, in writing, a tentative Job Mix Formula (JMF) on the NDOR Mix Design Submittal Form for verification to the Department.
 - b. The JMF shall be determined from a mix design for each mixture. A volumetric mixture design in accordance with AASHTO R 35 as modified within this specification will be required. However, the mixture for the Superpave specimens and maximum specific gravity mixture shall be aged for two hours at compaction temperature. The mixture shall be prepared using the following:
 - (1) Mixture Conditioning of Hot Mix Asphalt (HMA), AASHTO R 30.

- (2) Method for Preparing and Determining the Density of Hot Mix Asphalt Specimens by Means of the SHRP Gyratory Compactor, AASHTO T312.
 - c. The JMF shall identify:
 - (1) The virgin mineral aggregates and pit locations
 - (2) Recycled Asphalt Pavement (RAP) and source locations
 - (3) Hydrated lime
 - (4) Mineral filler
 - (5) The percent passing value for each specified sieve for the individual and blended materials
 - d.
 - (1) The Contractor shall submit one uncoated, proportioned 22 lb. (10,000 gram) sample of the blended mineral aggregates for consensus properties and specific gravity testing, for all mix types except SPS. Once verified, the Contractor may begin plant production and QC testing with the QA/QC program.
 - (2) The Contractor has the option of submitting the following; 2 proportioned 22 lb. (10,000 gram) samples of the blended mineral aggregates (which are precoated with hydrated lime) and two one-quart (liter) samples of the proposed PG Binder to be used in the mixture to the Department Materials and Research Central Laboratory at least 15 NDOR working days before production of asphaltic concrete. If submitted these samples will be used to verify the Contractor's Superpave mix design test results and mix properties.
 - (3) Submitted with these samples shall be a copy of the Contractor's results for all Superpave mix design tests.
 - (4) Mix design shall include at a minimum:
 - (i) The bulk specific gravity (Gsb), which shall be 2.585, for data purposes and as information only, for all mixes.
 - (ii) The target binder content. The binder content will be determined by ignition oven results. A correction factor of 0.3% will be added to the ignition oven results for mixes containing hydrated lime.
 - (iii) The supplier and grade of PG Binder.
 - (iv) The maximum specific gravity of the combined mixture (Rice).
 - (v) The bulk specific gravity (Gmb) and air voids at N initial (Nini), N design (Ndes) and N maximum (Nmax) of the gyratory compacted specimens.
 - (vi) Voids in the Mineral Aggregate (VMA) and Voids Filled with Asphalt (VFA) at Ndes.
 - (vii) Fine Aggregate Angularity (FAA) and specific gravity, Coarse Aggregate Angularity (CAA), Flat and Elongated Particles and Sand Equivalent of the aggregate blend.
 - (viii) Location description and/or legal descriptions and producers of materials used in the mix.
 - (ix) Dust to Binder Ratio.
 - (x) JMF compaction temperatures from NDOR Gyratory Temperature Table (See Table 1028.11).
 - (xi) The hydrated lime content.
3. Quality Control Program:

- a. The Contractor shall establish, provide, and maintain an effective Quality Control (QC) Program. The QC Program shall detail the methods and procedures that will be taken to assure that all materials and completed construction conforms to all contract requirements.
- b. Although guidelines are established and certain minimum requirements are specified herein and elsewhere in the contract, the Contractor shall assume full responsibility for placing a pavement course that meets the target field values.
- c. The Contractor shall establish a necessary level of control that will:
 - (1) Adequately provide for the production of acceptable quality materials.
 - (2) Provide sufficient information to assure both the Contractor and the Engineer that the specification requirements can be met.
- d.
 - (1) The Contractor shall develop and submit a copy of their QC Program to the Department. A copy of the QC Program shall be kept on file in the QC lab trailer. This Program shall be updated as needed and submitted annually for review.
 - (2) The Contractor shall not begin any construction or production of materials without an approved QC Program.
- e. The QC Program shall address, as a minimum, the following items:
 - (1) QC organization chart.
 - (2) Inspection requirements.
 - (i) Equipment.
 - (ii) Asphalt concrete production.
 - (iii) Asphalt concrete placement.
 - (3) QC testing plan.
 - (4) Documentation of QC activities.
 - (5) Requirements for corrective action when QC or acceptance criteria are not met.
 - (6) Any additional elements deemed necessary.
 - (7) A list, with the name and manufacturers model number, for all test equipment used during laboratory testing.
 - (8) A description of maintenance and calibration procedures, including the frequency that the procedures are performed.
- f. The QC organization chart shall consist of the following personnel:
 - (1) A Program Administrator:
 - (i) The Program Administrator shall be a full-time employee of the Contractor or a Subcontractor (Consultant) hired by the Contractor.
 - (ii) The Program Administrator shall have a minimum of 5 years' experience in highway construction.
 - (iii) The Program Administrator need not be on the job site at all times but shall have full authority to institute any and all actions necessary for the successful implementation of the QC Program.
 - (iv) The Program Administrator's qualifications and training shall be described in the QC Program.
 - (2) Quality Control Technicians:
 - (i) The quality control technicians shall report directly to the Program Administrator and shall perform all sampling and quality control tests as required by the contract.

- (ii) The QC technicians shall be certified every 5 years by the Department Materials and Research Division.
 - (iii) Certification at an equivalent level by a state or nationally recognized organization may be acceptable.
 - (iv) The QC technician's credentials and training records shall be submitted to the Department.
 - (v) The Contractor may have a non-certified technician working under the direct supervision of a certified technician for no more than one construction season.
- g.
 - (1) Inspections shall be performed daily to ensure continuing compliance with contract requirements until completion of the work.
 - (2) QC test results and periodic inspections shall be used to ensure the mix quality and to adjust and control mix proportioning.
- 4. Contractor's Lab Equipment:
 - a. The Contractor shall calibrate and correlate the testing equipment according to the procedures prescribed for the individual tests and conduct tests in conformance with specified testing procedures.
 - b. The Contractor shall have the following equipment (or approved equal) at or near the project location:
 - (1) A gyratory compactor and molds meeting AASHTO criteria.
 - (2) An Asphalt Content Ignition Oven meeting AASHTO criteria.
 - (3) Rice equipment specified in AASHTO T 209, procedure 9.5.1, Weighing in Water. The thermometer being used to measure water temperature will be as specified in T 209.
 - (4) FAA equipment specified in AASHTO T304.
 - (5) To test density of compacted asphaltic concrete, a minimum 6000 gm balance, 0.1 gm resolution, with under body connect and water container large enough to conveniently place specimen in the basket and completely submerge the basket and specimen without touching the sides or bottom is required.
 - (6) QC Laboratory which contain the following:
 - Air conditioner.
 - Dedicated phone.
 - FAX machine or email.
 - Photocopy machine.
 - Sample storage.
 - Work table.
 - Bulletin board.
 - Running water.
 - Desk and chair.
 - Separate power supply.
 - Incidental spoons, trowels, pans, pails.
 - (7) Diamond saw for cutting cores.
 - (8) Diamond core drill minimum 3 inch (75 mm).
 - (9) Oven, 347°F (175°C) minimum, sensitive plus 5°F (plus 2°C).
 - (10) USA Standard Series Sieves for coarse and fine aggregate with appropriate shakers (12 inch (300 mm) recommended).

- (11) Personal Computer capable of running the latest version of Department Superpave software, creating an electronic copy of the data, and printing to a Color Printer.
5. QC Testing Plan:
- a. The testing plan shall provide that the samples be collected in accordance with the Department statistically based procedure of random sampling.
 - b. The Contractor may add any tests necessary to adequately control production.
 - c. All QC test results shall be reported on the latest version of the Department's provided Superpave software by the Contractor with a copy provided to the Engineer within 1 week after the tests are complete. Daily review by the Engineer shall be allowed. At the completion of the asphalt production, the Contractor shall submit to the Department a final copy of the Superpave test results on electronic recording media (CD, e-mail, flash drive, etc.).
 - d. Corrective Action Requirements:
 - (1) The Contractor shall establish and utilize QC charts for individual QC tests. The requirements for corrective action shall be linked to the control charts.
 - (2) The Contractor's QC Program shall detail how the results of QC inspections and tests will be used to determine the need for corrective action.
 - (3)
 - (i) A clear set of rules to determine when a process is out of control and the type of correction to be taken to regain process control will be provided.
 - (ii) As a minimum, the plan shall address the corrective actions that will be taken when measurements of the following items or conditions relating to the mixture approach the specification limits:
 - (I) Plant produced mix gradations at laydown (See gradation tolerances).
 - (II) Binder content.
 - (III) Air voids.
 - (IV) VMA (mix design only).
 - (V) VFA (mix design only).
 - (VI) FAA AASHTO T 304.
CAA ASTM D 5821.
 - (VII) Dust to Binder Ratio.
 - (VIII) Density.
 - (IX) Contaminates.
 - (iii) Corrective actions that will be taken when the following conditions occur:
 - (I) Rutting.
 - (II) Segregation.
 - (III) Surface voids.
 - (IV) Tearing.
 - (V) Irregular surface.
 - (VI) Low Density.

1028.02 -- Material Characteristics

- 1. The type of PG Binder will be shown in the contract.

2. Recycled Asphalt Pavement:
 - a. The Contractor may submit to the State a proposal to supplement the virgin aggregates of the asphaltic concrete mix with a Contractor’s specified percentage of Recycled Asphalt Pavement (RAP). The Contractor is responsible for investigating and maintaining the quality and verifying the quantity of the RAP material.
 - b. In recycled asphaltic concrete mixtures, the allowable percent of RAP will be as shown in Table 1028.01.

Table 1028.01

Asphaltic Concrete Type	Percent, RAP	
	Minimum	Maximum
SPS	0	50
SPR	0	50
SPH	0	35

3. Aggregates:
 - a. Aggregates for use in superpave asphaltic concrete shall be tested on an individual basis.
 - b. With the exception of Asphaltic Concrete Type SPS the blended mineral aggregate shall not contain more than 80% limestone on the final surface lift of asphaltic concrete.
 - c. Asphaltic Concrete Type SPR may contain a total maximum of 10% of the virgin material that is composed of natural, uncrushed aggregate by manmade methods commonly known as but not limited to: 47B gravel, 2A gravel, gravel surfacing, sluice sand, blow sand, waste sand, fill sand, road gravel, roofing gravel, hot mix sand or gravel, coarse sand, fine sand, plaster sand, masonry sand, pit run sand or gravel. For clarification on any proposed gravel, contact the Department Flexible Pavements Engineer.
 - d. Chat or coal sand will not be allowed in any mix.
 - e. Crushed rock material for use in asphaltic concrete, 1/4 inch (6.35 mm) and smaller, screenings and manufactured sand shall have a Sodium Sulfate loss of not more than 12% by mass at the end of 5 cycles. Sampling size and frequency shall adhere to the current Department Materials Sampling Guide.
 - f. Quartzite and granite shall conform to the requirements of Subsection 1033.02, Paragraph 4, a. (8). Sampling size and frequency shall adhere to the current Department Materials Sampling Guide.
 - g. Crushed rock (Limestone) and Dolomite shall conform to the requirements of Paragraph 4.a. (4), (5) and (6). of Subsection 1033.02 of the Standard Specifications. Sampling size and frequency shall adhere to the current Department Materials Sampling Guide.
 - h. Soundness tests shall not be required for fine sand.
 - i. Once the satisfactory quality of aggregates from a source has been established, sufficient additional soundness tests will be performed to insure the continued satisfactory quality of the material, as determined by the Materials Sampling Guide
 - j. Aggregate consensus properties may be performed on material prior to the application of hydrated lime.

- k. The coarse aggregate angularity value of the blended aggregate material shall meet or exceed the minimum values for the appropriate asphaltic concrete type as shown in Table 1028.02. If the coarse portion of the blend is all ledge rock the CAA tests may be waived.

**Table 1028.02
Coarse Aggregate Angularity
(ASTM D 5821)**

Asphaltic Concrete Type	CAA (minimum)
SPS	--
SPR	83
SPH	95/90*

Denotes two faced crushed requirements

- l. The fine aggregate angularity value of the blended aggregate material shall meet or exceed the minimum values for the appropriate asphaltic concrete type as shown in Table 1028.03.
- m. The specific gravity for calculation of the Fine Aggregate Angularity (FAA) shall be determined on a washed combined aggregate sample of the material passing the No. 8 (2.36 mm) sieve and retained on the No. 100 (150 μm) sieve. The Contractor will determine the specific gravity to be used in the calculation of FAA mixture design value(s) and, if verified by the Department Aggregate Laboratory, this same value can be used throughout production. The verification value determined by the Department Aggregate Laboratory will be on a combined aggregate sample supplied by the Contractor that is representative of the material proposed or being used during production. The specific gravity to be used throughout production to calculate FAA values will be the Contractor's verified value or the Department determined value (whenever verification is not made) and will be noted on the Mix Design. Changes in aggregate percentages during production may require determination of a revised specific gravity for FAA.

**Table 1028.03
Fine Aggregate Angularity
(AASHTO T304 Method A)**

Asphaltic Concrete Type	FAA (minimum)
SPS	--
SPR	43.0
SPH	45.0

- n. The coarse aggregate shall not contain flat and elongated particles exceeding the maximum value for the appropriate asphaltic concrete type category shown in these provisions according to Table 1028.04.

**Table 1028.04
Flat and Elongated Particles*
(ASTM D 4791)**

Asphaltic Concrete Type	Percent, Maximum
SPS	25
SPR	10
SPH	10

*Criterion based on a 5:1 maximum to minimum ratio.

- o. The sand equivalent of the blended aggregate material from the fine and coarse aggregates shall meet or exceed the minimum values for the appropriate asphaltic concrete type shown in these provisions according to Table 1028.05.

**Table 1028.05
Sand Equivalent Criteria
(AASHTO T 176)**

Asphaltic Concrete Type	Sand Equivalent, Minimum
SPS	30
SPR	45
SPH	45

- p. Dust to binder ratio is the ratio of the percentage by weight of aggregate finer than the No. 200 (75 µm) sieve to the asphalt content expressed as a percent by weight of total mix. The dust to binder ratio shall be within 0.70 and 1.70.
- q. The blended aggregate shall conform to the gradation requirements specified in Table 1028.06 and Table 1028.07 for the appropriate nominal size.

**Table 1028.06
Gradation Control Points for 0.75 Inch (19 mm) and 0.5 Inch (12.5 mm) Nominal Size**

English Sieve (Metric)	0.75 Inch (19 mm) Control Points (percent passing)		0.5 Inch (12.5 mm) Control Points (percent passing)	
	Minimum	Maximum	Minimum	Maximum
1 inch (25 mm)	100.0			
3/4 inch (19 mm)	90.0	100.0	100.0	
1/2 inch (12.5 mm)		90.0	90.0	100.0
3/8 inch (9.5 mm)				90.0
No. 8 (2.36 mm)	23.0	49.0	28.0	58.0
No. 16 (1.18 mm)				
No. 30 (600 µm)				
No. 50 (300 µm)				
No. 200 (75 µm)	2.0	8.0	2.0	10.0

Table 1028.07
Gradation Control Points for 0.375 Inch (9.5 mm) Nominal Size and SPR

English Sieve (Metric)	0.375 Inch (9.5 mm) Control Points (percent passing)		SPR Control Points (percent passing)		SPR (Fine) Control Points (percent passing)	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
3/4 inch (19 mm)			98.0	100.0		
1/2 inch (12.5 mm)	100.0					
3/8 inch (9.5 mm)	90.0	100.0	81.0	89.0	81.0	96.0
No. 4 (4.75 mm)		90.0				
No. 8 (2.36 mm)	32.0	67.0	46.0	56.0	46.0	56.0
No. 16 (1.18 mm)						
No. 30 (600 µm)						
No. 50 (300 µm)			12.0	21.0	12.0	21.0
No. 200 (75 µm)	2.0	10.0	4.0	9.0	4.0	9.0

- r. The combined mineral aggregate for Asphaltic Concrete, Type SPS, shall be an aggregate or a combination of aggregates, and mineral filler if needed, that conforms to the gradation requirements specified in Table 1028.08.

Table 1028.08
Gradation Control Points for Type SPS

English Sieve (Metric)	Control Points (percent passing)	
	Minimum	Maximum
1 inch (25 mm)	100.0	
¾ inch (19 mm)	94.0	100.0
½ inch (12.5 mm)	81.0	100.0
No. 4 (4.75 mm)	70.0	90.0
No. 8 (2.36 mm)	42.0	70.0
No. 16 (1.18 mm)	29.0	43.0
No. 30 (600 µm)	19.0	34.0
No. 50 (300 µm)	11.0	20.0
No. 200 (75 µm)	2.0	10.0

- s. Mineral filler shall consist of pulverized soil, pulverized crushed rock, broken stone, gravel, sand-gravel, sand or a mixture of these materials that conforms to the requirements in Table 1028.09.

Table 1028.09
Mineral Filler for Type SPS

	Min.	Max.
Total Percent Passing the No. 50 (300 µm) Sieve	95	100
Total Percent Passing the No. 200 (75 µm) Sieve	80	100
Plasticity Index (material passing the No. 200 (75 µm) Sieve, except soil)	0	3
Plasticity Index for Soil	0	6

1028.03 -- Acceptance Requirements

1. Mix Criteria:
 - a. The target value for the air voids of the SPH Asphaltic Concrete shall be 4% ($\pm 1\%$) at the Ndes number of gyrations. For Type SPS Asphaltic Concrete the air voids at Ndes shall be a minimum of 1.5% with a maximum of 5.0%. For Type SPR Asphaltic Concrete the air voids shall be 3% ($\pm 1\%$) at the Ndes number of gyrations.
 - b. The design criteria for each mixture shall be determined from Tables 1028.10, 1028.11, and 1028.12.

**Table 1028.10
Gyratory Compaction Effort
(Average Design High Air Temperature <39 degrees C)**

Asphaltic Concrete Type	Nini	Ndes	Nmax
SPS	6	40	62
SPR	7	65	100
SPH	8	95	150

**Table 1028.11
Gyratory Compaction Temperatures**

Mix Type	% RAP	Compaction Temp °F
SPS	0-25	270 \pm 5
	26-50	280 \pm 5
SPR	0-35	280 \pm 5
	36-50	290 \pm 5
SPH	0-35	300 \pm 5

**Table 1028.12
Minimum Binder Content**

Mix Type (Metric)	Minimum Binder Content, Percent
SPS	4.8
SPR	5.0
3/8 inch (9.5 mm)	5.5
1/2 inch (12.5 mm)	5.1
3/4 inch (19 mm)	5.0

- c. During production of Lot #1, the Contractor shall provide to the Department 6 properly prepared gyratory samples for AASHTO T 283 testing for all mixtures. Superpave mixtures shall contain 1.25% hydrated lime as specified in the Special Provision "Hydrated Lime for Asphaltic Mixtures". Each Superpave mixture shall be tested for moisture sensitivity in accordance with AASHTO T 283. The 6 inch (150 mm) specimens shall be compacted in accordance with AASHTO T 312 to 7% ($\pm 0.5\%$) air voids at 95 mm in height and evaluated to determine the Tensile Strength Ratio (TSR).

- d. During production of Lot #1, the Contractor shall provide to the Department two 75mm gyratory puck samples at 4.0% voids ($\pm 0.5\%$) for APA testing for all mixtures except Asphaltic Concrete Type SPS.
2. The Contractor shall make Mix adjustments when:
 - a. The mix does not meet the current approved JMF or any other requirements of the contract.
 - b. Surface voids create a surface or texture that does not meet the criteria of Sections 502 and 503 in these Standard Specifications.
 - c. Rutting occurs.
 3. The Contractor shall inform the Engineer when changes in mixture properties or materials used occur for any reason. Changes such as, but not limited to, types or sources of aggregates or changes in grades, sources, properties or modification procedures (if modified) of PG Binders. The Department may require a new job mix formula, mix design and moisture sensitivity test. The new proposed job mix formula shall be in accordance with the requirements as stated above.
 4. Mix adjustments at the plant are authorized within the limits shown in Table 1028.13 as follows:
 - a. The adjustment must produce a mix with the percent air voids and all other properties as stated in these specifications.
 - b. All adjustments must be reported to the Engineer.
 - c. The adjustment values in Table 1028.13 will be the tolerances allowed for adjustments from the Department verified mix design "Combined Gradation" target values which resulted from production or mix design adjustments, but cannot deviate from Superpave gradation criteria. Mix adjustments for individual aggregates, including RAP, greater than 25% of the original verified mix design proportion or greater than 5% change in the original verified mix design percentage, whichever is greater, may require the Contractor to submit a new mix design, as determined by the Engineer. The Contractor is responsible for requesting new mix design targets as they approach these tolerances, failure to do so may result in a suspension of operations until a new mix design is approved.

Table 1028.13

Aggregate Adjustments	
Sieve Size	Adjustments
1 inch (25 mm), 3/4 inch (19 mm), 1/2 inch (12.5 mm), 3/8 inch (9.5 mm), No. 4 (4.75 mm)	$\pm 6\%$
No. 8 (2.36 mm), No. 16 (1.18 mm), No. 30 (600 μm), No. 50 (300 μm)	$\pm 5\%$
No. 200 (75 μm)	$\pm 2\%$

5. Sampling and Testing:
- a. The Contractor shall take samples at frequencies identified by the Engineer, according to the Department statistically based procedure. The samples shall be approximately 75 lbs (34 kg) and split according to AASHTO T-248 to create a companion sample. This sample splitting can be either at: 1) the sampling location, with the Department taking custody of their sample at that time or 2) after being transported to the test facility in an insulated container, with the Department taking custody of their sample at that time as determined by the Engineer. The details of sampling, location, splitting etc. shall be determined at the pre-construction conference.
 - b. All samples transported to the test facility and companion samples within the Lot shall be identified by attaching or faxing the lab calculation sheet from the latest version of the superpave software, stored, and retained by the Contractor until the Department has completed the verification testing process. Transporting of all samples will be under the observation of Department.
 - c.
 - (1) The sample shall be taken from the roadway, behind the paver before compaction or from the wiNDORow. For SPS mixes, the Contractor has the option to obtain the samples directly at the plant.
 - (2) At least one QC sample shall be tested for every 750 tons (680 Mg) of plant produced mix.
 - (i) If, at the completion of the project, the final lot consists of less than 3,750 tons (3,400 Mg) of asphaltic concrete, 1 sample for each 750 tons (680 Mg) or fraction thereof, shall be taken and tested.
 - (3) Additional sampling and testing for the Contractor's information and quality control may be performed at the Contractor's discretion. Any additional testing will not be used in pay factor determination.
 - (4) (i) When cold feed samples are being taken, the acquisition shall be timed such that the material in the sample represents, as close as possible, the same material in the sample taken behind the paver. If cold feeds are sampled and tested by Contractor, a split of that sample must be submitted with the hot mix subplot sample. The Contractor will be notified what subplot (a minimum of 1 subplot per lot) sample must be tested for FAA and CAA from the blended cold feed material according to the Department random sampling schedule. All other FAA and CAA subplot samples may be taken from the randomly selected portion of the blended cold feed material or obtained from the random samples taken behind the paver. Samples shall be taken under the observation of Department and split according to AASHTO T-248, with the Department taking custody of their sample at that time.
 - (ii) For projects using RAP material the FAA shall be established as follows: a RAP sample will be processed through an ignition oven and then combined with the proportioned amount of virgin aggregate defined by the mix design and then proceeding with FAA and CAA testing.
 - d. The sample shall be compacted immediately while still hot (additional heating may be required to raise the temperature of the sample to compaction temperature).
 - e. Each production sample shall be tested as follows:

- (1) Bulk Specific Gravity (Gmb) shall be determined for each specimen in accordance with AASHTO T 166 Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface Dry Specimens. One specimen shall be compacted for each production sample.
- (2) One Theoretical Maximum Specific Gravity (Gmm) test for each production sample of uncompacted mixture shall be determined in accordance with AASTHO T 209 procedure 9.5.1. Weight in water - Maximum Specific Gravity of Bituminous Paving Mixtures.
- (3)
 - (i) The Blended Aggregate Bulk Specific Gravity (Gsb) shall be 2.585 for information only for all mixes.
 - (ii) FAA - AASHTO T 304 Method A. The pour time of the test sample into the funnel shall be completed in 5±1 seconds.
 - (iii) CAA - ASTM 5821. For SPR mixes, CAA testing and results are only required on the cold feed verification test for the lot.
- (4) The laboratory air voids shall be determined in accordance with the following:

Table 1028.14

$Gmb(corr)@Nany = Gmb(meas)@Nmax \times (height@Nmax \div height@Nany)$ $\%Gmm(corr)@Nany = 100 \times (Gmb(corr)@Nany \div Gmm(meas))$ $\% \text{ Air Voids}@Nany = 100 - \%Gmm(corr)@Nany$ $VMA@Ndes = 100 - (Gmb(corr)@Ndes \times Ps \div Gsb)$ $VFA@Ndes = 100 \times ((VMA@Ndes - \% \text{ Air Voids}@Ndes) \div VMA@Ndes)$ $\text{Measured} = (meas)$ $\text{Corrected} = (corr)$

- (5)
 - (i) The percent of PG Binder shall be determined for each QC test. The percent of PG Binder will be computed by ignition oven results. A correction factor of 0.3% will be added to the ignition oven results for mixes containing hydrated lime.
 - (ii) The gradations shall be determined for each QC test using AASHTO T 30.
 - (6) Except as noted in this Subsection, all sampling and testing shall be done as prescribed in the Department Materials Sampling Guide and Standard Method of Tests.
- f. Testing Documentation:
- (1) All test results and calculations shall be recorded and documented on data sheets using the latest version of Department provided "Superpave" software. A copy containing complete project documentation will be provided to the Department at the completion of asphalt production.
- g. Superpave Software:
- (1) QC charts from the software shall be made available for review by the Engineer at any time.
 - (2) As a minimum, the following values shall be reported on Department provided software:
 - (i) Laboratory Gyratory density.
 - (ii) Ignition oven or cold feed aggregate gradations for all Superpave sieves will be reported.

- (iii) PG Binder content shall be plotted to the nearest 0.01% by ignition oven results in accordance with AASHTO T 308.
- (iv) The theoretical maximum specific gravity (Rice) to the nearest 0.001% will be reported.
- (v) Laboratory Gyratory air voids at Ndes shall be plotted to nearest 0.1%. Laboratory Gyratory air voids, at Nini, Ndes and Nmax shall be reported to nearest 0.1%.
- (vi) FAA and CAA of the asphaltic concrete for both cold feed and ignition oven samples will be reported to the nearest 0.1% for FAA and 1% for CAA. A minimum of one subplot FAA and CAA cold feed sample per lot will be tested and recorded on Department provided software.
- (vii) VMA content shall be plotted to nearest 0.1% and VFA shall be reported to the nearest 0.1%.
- (viii) Dust to Binder ratio to the nearest 0.01 will be reported.

6. Verification Sampling and Testing:
- a. The Department will select and test at random one of the subplot samples (750 tons, 680 Mg) within a Lot (3750 tons, 3400 Mg) for verification and report results.
 - b. The results of Contractor QC testing will be verified by the Department's verification tests. Any samples outside of the tolerances in Table 1028.15 and 1028.16 will result in an Independent Assurance (IA) review of testing and may result in the Department test results being applied.
 - (1) On any given Lot, if the results of Air Void verification testing and its companion QC testing are within 1.0% air voids, the Air Void verification for the entire Lot is complete and the Contractor test results will be used to determine the pay factors. If the Air Void verification test results and the companion QC test results are outside the above tolerance, the results from the verification test will be used to determine the pay factor for that subplot. Any or all of the remaining four Department subplot samples may be tested and the Department subplot test results may be applied to the respective sublots and the resulting pay factors will apply.
 - (2) On any given Lot, if the results of the FAA verification testing and its companion QC testing are within 0.5 percent, the FAA verification for the entire Lot is complete and the Contractor test results will be used to determine the pay factor. If the FAA verification test results and the companion QC test results are outside the above tolerance, the results from the verification test will be used to determine the pay factor for that subplot. Any or all of the remaining four Department subplot samples may be tested and the Department subplot test results may be applied to the respective sublots and the resulting pay factors will apply.
 - c. When verification tests are within testing tolerance but results show a consistent pattern of deviation from the QC results, the Engineer may cease production and/or request additional verification testing or initiate a complete IA review.

**Table 1028.15
Asphaltic Concrete Testing Tolerances**

Test	Tolerance
Asphalt Content by Ignition Oven	0.5%
Gyratory Density	0.020
Maximum Specific Gravity	0.015
Bulk Dry Specific Gravity (Gsb)	0.020
FAA	0.5%
CAA	10%
Field Core Density	0.020
Air Voids	1.0%

**Table 1028.16
Blended Aggregate Gradation
Testing Tolerances**

Sieve Size	Tolerance
3/4 inch (19 mm), 1/2 inch (12.5 mm), 3/8 inch (9.5 mm), No. 4 (12.5 mm), No. 8 (2.36 mm)	5%
No. 16 (1.18 mm), No. 30 (600 μm), No. 50 (300 μm)	4%
No. 200 (75 μm)	2%

- d. Independent Assurance (IA) Review of Testing:
- (1) The Contractor shall allow the Department personnel access to their laboratory to conduct IA review of technician testing procedures and apparatus. Any deficiencies discovered in testing procedures will be reported by the department and corrected by the Contractor.
 - (2) During IA review, the Department personnel and the Contractor will split a sample for the purpose of IA testing. The samples selected will be tested in the Department Branch Laboratory. Any IA test results found to be outside of defined testing tolerances above will be reported. The Contractor shall verify the testing apparatus and make corrections if the apparatus is out of tolerance.
 - (3) See Section 28 of the Materials Sample Guide for more information on IA testing.
- e. If the project personnel and the Contractor cannot reach agreement on the accuracy of the test results, the Department will be asked to resolve the dispute, which will be final. It is the Contractor's responsibility to obtain a large enough sample size for any referee testing (a total sample size of 6000 grams, to be retained by the Department after splitting, is recommended for FAA testing). All dispute resolutions will be in accordance with the Quality Assurance Program requirements in the NDOR Materials Sampling Guide.

7. Production Tolerances, Acceptance, and Pay Factors

**Table 1028.17
Production Tolerances***

<i>Test</i>	<i>Allowable Deviation from Specification</i>
<i>Dust to Asphalt Ratio</i>	None
<i>Coarse Aggregate Angularity</i>	- 5% below Min.
<i>Fine Aggregate Angularity for SPR Only</i>	- 0.2% below Min. for cold feed - 0.5% below Min. for ignition oven
<i>Fine Aggregate Angularity for all other mixes</i>	- 0.5% below Min. for cold feed - 1.0% below Min. for ignition oven
Minimum Binder Content	None

* These tolerances are applied to the mix design specification values, not the submitted mix design targets.

- a. The Contractor shall notify the Engineer whenever a test result approaches the Specification limits.
- b. When any single test result for FAA testing falls outside the allowable production tolerances in Table 1028.17, the material represented by this test will be accepted with a penalty as shown in Table 1028.18 or rejected, as determined by the Engineer. For all other tests, when any single test result, on the same mix property, from two consecutive QC samples fall outside the allowable production tolerances in Table 1028.17, the material represented by these tests will be accepted with a 20% penalty or rejected, as determined by the Engineer.

**Table 1028.18
FAA Penalty Scale**

Percentage outside of allowable deviation given in Table 1028.17	Penalty for SPR	Penalty for SPH
<i>0.1%</i>	20% or reject	5% or reject
<i>0.2%</i>	20% or reject	10% or reject
<i>0.3%</i>	20% or reject	15% or reject
<i>0.4% or greater</i>	20% or reject	20% or reject

- c. The Contractor shall assume the responsibility to cease operations when specifications are not being met.
- d. Acceptance and pay factors for Asphaltic Concrete Type SPS will be based on compacted in place average density.
- e. For each subplot of Asphaltic Concrete Type SPR and SPH, the asphaltic concrete unit price is a product of all applicable pay factors for the item "Asphaltic Concrete, Type ____". Included in a subplot, following approval of the control strips, may be any roadway Asphaltic Concrete Type SPR or SPH which is produced and approved by the Engineer for use as Patching, State Maintenance Patching, and Asphalt for Intersections and Driveways on project shall be

eligible for inclusion in subplot(s) tonnage pay factor determination using the roadway Asphaltic Concrete Type _____ unit price. When a control strip is not constructed, the pay factor for the running average of four air voids shall be fixed at 1.0 for the first three asphaltic concrete sublots.

- (1) When there is a production tolerance pay factor penalty as stated in Paragraph 7.b. subsection 1028.03 this penalty percentage will be entered in the Superpave Asphalt Pay Factor Summary under production specifications for each subplot affected. These individual pay factors will then be multiplied by each other to determine a total pay factor for each subplot [(750 tons) (680 Mg)].
- f. The pay factors for the single test air voids and moving average of four air voids pay factors will be determined in accordance with Table 1028.19.

Table 1028.19
Acceptance Schedule
Air Voids - N_{des}

Air voids test results for Asphaltic Concrete Type SPR	Air voids test results for SPH Asphaltic Concrete	Pay Factor	
		Moving average of four	Single test
Less than 0.5%	Less than 1.5%	50% or Reject	50% or Reject
0.5% to 0.9%	1.5% to 1.9%	50% or Reject	50%
1.0% to 1.4%	2.0% to 2.4%	50% or Reject	95%
1.5% to 1.9%	2.5% to 2.9%	90%	95%
2.0% to 2.4%	3.0% to 3.4%	100%	100%
2.5% to 3.5%	3.5% to 4.5%	102%	104%
3.6% to 4.0%	4.6% to 5.0%	100%	100%
4.1% to 4.5%	5.1% to 5.5%	95%	95%
4.6% to 5.0%	5.6% to 6.0%	90%	95%
5.1% to 5.5%	6.1% to 6.5%	50% or Reject	90%
5.6% to 6.0%	6.6% to 7.0%	50% or Reject	50%
6.1% and over	7.1% and over	50% or Reject	50% or Reject

- 8. Asphalt Concrete Density Samples:
 - a. The Contractor shall perform density tests under direct observation of Department personnel. The Contractor shall establish the method of testing in the preconstruction conference and shall test in accordance with the AASHTO T 166, NDOR T 587, or as otherwise described in these Special Provisions. The Contractor shall insure that the proper adjustment bias and/or correction factors are used and accessible to Department personnel along with all other inputs when NDOR T 587 is selected. All correlation factors and test results shall be generated and reported on the Department Density spreadsheet. When AASHTO T 166 is being used, the Department will observe the Contractor taking, transporting, and testing the cores. The Department will take immediate custody of the cores at the completion of the testing. All disputed values determined using NDOR T 587 will be resolved using AASHTO T 166.
 - b. The Contractor shall determine the density of samples by comparing the specific gravity of the core sample to the Maximum Specific Gravity (Rice) as follows:

$$\% \text{ Density} = \frac{\text{Specific Gravity of Core}}{\text{Maximum Mix Specific Gravity Rice}} \times 100$$

where:

$$\text{Sp. Gr. of Core} = \frac{\text{Wt. of Core in Air}}{\text{Wt. of SSD Core} - \text{Wt. of Core in Water}}$$

$$\text{Maximum Mix Specific Gravity (Rice)} = \frac{\text{Wt. of Mix in Air}}{\text{Wt. of Mix in Air} - \text{Wt. of Mix in Water}}$$

- Note:** The individual QC test value of the Maximum Mix Specific Gravity (Rice), determined by AASHTO T 209, will be used to calculate the density of each corresponding core.
- c. The Contractor shall cut cores the first day of work following placement of the mixture. The core samples shall be a minimum of a 3 inch (75mm) diameter.
 - d. Normally, 1 sample for determination of density will be taken from each subplot (750 tons) (680 Mg) at locations determined by the Engineer.
 - e. The average density of the lot shall be used to compute the pay factor for density. Exceptions to the sampling and testing of core samples for the determination of density are as follows:
 - (1) When the nominal layer thickness is 1 inch (25 mm) or less, the sampling and testing of density for this layer will be waived.
 - (2) When the average thickness of the 5 cores for a lot is 1 inch (25 mm) or less, the testing of density samples for this lot will be waived.
 - (3) When the nominal layer thickness and the average of the original 5 cores for a lot are both more than 1 inch (25 mm), but some of the cores are less than 1 inch (25 mm) thick, additional cores shall be cut at randomly selected locations to provide 5 samples of more than 1 inch (25 mm) thickness for the determination of the pay factor for density.
 - f.
 - (1) If, at the completion of the project, the final lot consists of less than 3,750 tons (3400 Mg) of asphaltic concrete, a minimum of 3 samples, or 1 sample for each 750 tons (680 Mg) or fraction thereof, whichever is greater, shall be taken and tested for density.
 - (2) The test results shall be averaged and the density pay factor based on the values shown in Table 1028.20.
 - (3) Should the average of less than 5 density tests indicate a pay factor less than 1.00, additional density samples to complete the set of five shall be taken at randomly selected locations and the density pay factor based on the average of the 5 tests.

Table 1028.20

Acceptance Schedule Density of Compacted Asphaltic Concrete	
Average Density (5 Samples, Percent of Voidless Density)	Pay Factor
Greater than 92.4	1.00
Greater than 91.9 to 92.4	0.95
Greater than 91.4 to 91.9	0.90
Greater than 90.9 to 91.4	0.85
Greater than 90.4 to 90.9	0.80
Greater than 89.9 to 90.4	0.70
89.9 or Less	0.40 or Reject

- g. If requested by the Contractor, check tests for all density tests in the original set, taken no later than the working day following the receipt of all test results for the lot, will be allowed in lots with a density pay factor of less than 1.00. No re-rolling will be allowed in these lots. Locations for check tests will be provided by the Engineer from the Random Sampling Schedule. The average density obtained by the check tests shall be used to establish the density pay factor for the lot.
- h. The location of density samples are identified by the Random Sampling Schedule. When the random location is noted as zero or the lane width (i.e., zero or 12 ft. on a 12-foot lane), the core shall be cut with the outer edge of the core barrel no greater than 4 inches away (laterally) from the edge of the top of the mat for an unconfined edge or from the edge of the top of the hot mat (joint) for a confined edge. If using a nuclear gauge, the 4 inches would be measured to the edge of the gauge base. The percent density value at these edge-of-lane locations shall be adjusted upward by 2.5%, but to a value of no greater than 92.5%, and the resultant value used in determining the density pay factor. No initial value of 92.5 or greater shall be adjusted.

12) NDOR PERFORMANCE GRADED BINDER

All references to Nebraska Department of Roads (NDOR) in this section shall be removed and replaced with the Owner. PG Binder shall not be measured separately for measurement and payment. It shall be considered subsidiary to asphaltic concrete pavement.

Section 1029 in the Standard Specifications is void and superseded by the following:

I. Description

The performance graded binder to be used on this project shall be PG Binder PG64-28 supplied by a Certified Supplier.

II. Certified Supplier

A supplier must be certified by the Nebraska Department of Roads to be allowed to supply Performance Graded Binder in Nebraska. To be considered certified by the NDOR, a supplier must participate in one or more of the following PG Binder groups.

1. AASHTO Materials Reference Laboratory (AMRL)
2. Western Cooperative Testing Group (WCTG)
3. Combined States Binder Group (CSBG)

The supplier must also maintain and follow the requirements of the group or groups in which they participate in, to maintain certification by the Nebraska Department of Roads. In addition, active participation is required to maintain certification by the Department. Active participation will include submitting of round robin sample results, along with meeting other requirements of the group or groups.

A certified supplier may be asked to supply to the Department, past round robin results, laboratory inspection reports, reasons for and investigative reports on out lying results, quality control testing, and/or technician training and proficiency testing reports.

The binder supplier agrees to inspection of their plant or terminal without notice anytime during production or supplying of material to the Department. The inspection may also include the supplier's laboratory.

A certified supplier can voluntarily submit samples of binders proposed for use to the Materials and Research Bituminous Laboratory for quality and verification testing.

III. Supplier Certification

A supplier may request certification by contacting the Nebraska Department of Roads, Materials and Research Division, Flexible Pavement Engineer at (402) 479-4675. A temporary certification may be issued for a period of up to one year. Split sample testing will be required prior to receiving a temporary certification. Split sample testing will be done on all grades of binder that the supplier intends to supply during the temporary certification. The supplier will have up to one year to become certified by participating in and following the requirements of one or more of the approved binder groups.

A supplier may become certified through active participation in other binder certification/round robin groups that are approved by the NDOR. The NDOR may request from the supplier prior to approval, past or current round robin results, quality control testing, laboratory inspection reports, and/or technician training and proficiency testing reports.

IV. Loss of Certification

Certification will be withdrawn from a supplier for a minimum of 6 months when one or more of the following conditions exist.

1. Inability to consistently supply material meeting specifications as outlined herein.
2. Failure to maintain an acceptable quality control program

3. The failure to meet one or more of the conditions of being a Certified Supplier as outlined above.

Notification of decertification of a supplier will be submitted in writing by the NDOR. Material from a decertified source will not be accepted for use on NDOR projects and the NDOR districts will be notified of this action.

V. Supplier Recertification

If a supplier has lost certification and seeks to be recertified, the following steps are required.

1. Fulfill the requirements outlined above for gaining Certified Supplier status.
2. Submit documentation to the Flexible Pavement Engineer explaining why decertification occurred, and the actions that are going to be taken to correct the problems identified in writing by the NDOR.

VI. Binder Sampling and Testing:

1. Lots. Each 3750 tons (3400 Mg) of HMA produced will be a binder lot.
2. A binder lot will include only one PG Binder grade or a blend as allowed in paragraph VI.6.e.
3. A binder lot will only include one supplier of the PG Binder or a blend as allowed in paragraph VI.6.e.
4. Blending of different binder grades and binders from different suppliers will be allowed with restrictions as noted in paragraph VI.6.e. The Engineer must be notified of the intent to blend prior to actual blending.
5. All binders shall be sampled at the rate of at least one sample per lot.
 - a. The sample shall consist of two one-quart (liter) cans and shall be taken by the Contractor's Certified Sampling Technician, with assistance from or under supervision of NDOR personnel. The sample shall be taken at the plant from the line between the storage tank and the mixer or from the tank supplying material to the line, at a location at which material sampled is representative of the material in the line to the mixer. One can will be tested for specification compliance, and the other can portion will be saved for check tests and dispute resolution, if needed. The sampling process shall follow procedures of the NDOR Materials Sampling Guide.
 - b. Testing. When the tested PG Binder is in compliance, the binder lot will be accepted and both cans of the sample can be discarded. If the tested PG Binder does not comply, then the price of the PG Binder lot represented by the sample shall be adjusted according to Tables 2 and 3. Overall project average testing requirements and price adjustments will also apply, as stated in Table 4.

6. Material Requirements

- a. Performance graded binder, as specified in the contract items, shall be in accordance with the PG+ specifications as noted, and AASHTO M320 with the exception of Direct Tension.
- b. Substitution of a PG Binder, which exceeds the upper and lower grade designations from the specified, requires advance notification of the Engineer, and be documented by a no cost change order. The bill of lading or delivery ticket shall state the binder grade and specific gravity.
- c. Material Certification - A Material Certification shall be submitted prior to construction, stating the type of modifier being used, and the recommended mixing and compaction temperatures for the Hot Mix Asphalt. The Material Certification must state that acid has not been used. The Material Certification must also state that the material has not been air blown or oxidized.
- d. The Contractor shall receive from the supplier, instructions on the proper storage and handling of each grade and shipment of PG Binder.
- e. Blending of PG Binders at the hot mix plant site will be allowed only when transitioning to an asphalt mixture requiring a different grade of binder, and with the following restrictions:
 - (1) The resultant blend will meet PG+ (modified binders) and/or AASHTO M320 specifications when tested as $\pm 3^{\circ}$ C of the specified PG binder. The sample of the blended material 1) will be considered as a lot sample, 2) will be taken during initial production following the blending of the binders, and 3) shall have deductions applied as per Tables 2, 3, and 4 when not meeting specifications, will apply. On the blended sample's identification form will be a note explaining the blending conditions and a statement that the sample is a blend of materials. The next lot sample, following the sample representing the blend, will be tested as the specified binder grade for the asphalt mixture being produced and shall meet AASHTO M320 and PG+ (if modified) specifications.
 - (2) Modified Binders - Only blending of the same type of elastomer modifiers listed in VI.6.f.(1) will be allowed.
- f. When modified binders are specified, the following PG+ specifications (Table 1) and AASHTO M320 (with the exception of Direct Tension) will apply:
 - (1) The performance graded binder shall be a binder, which incorporates a blend of base asphalt and elastomer modifiers of styrene-butadiene (SB), styrene-butadiene-styrene (SBS) or styrene-butadiene-rubber (SBR). Acid shall not be used. Air blown and/or oxidized asphalt will not be allowed. The supplier must certify that the binder is not acid modified, and that acid was not used. The binder supplier must also

certify that air blowing or oxidization has not been done/used to modify the binder or used to change the properties of the binder.

- (2) The composite material shall be thoroughly blended at the asphalt refinery or terminal prior to being loaded into the transport vehicle. The polymer modified binder shall be heat and storage stable and shall not separate when handled and stored as per the supplier's storage and handling recommendations.
- (3) The composite material shall be homogenous, and shall not demonstrate evidence of 1) localized gellation or over-crosslinking of polymers, 2) improper use of gelling modifiers used in addition to polymer modification, or 3) otherwise any other lumpy conglomerations.
- (4) To insure the binder is of a modification system in which no acid is used, the Materials and Research Bituminous Laboratory will perform a random free-acid verification test. ARR-MAZ AD-here LOF65-00, amine anti strip will be added at the rate of 0.5% to sample(s) that have been heated to 300 degrees F or until viscous and stirred for a minimum of 5 minutes. The resultant blend will then be tested for PG grading and compared to PG grading prior to the blending. Binders tested for acid modification shall meet AASHTO M320 specifications, and shall not show a drop of $G^*/\sin(\delta)$ of more than 25% when compared to the result(s) of the sample prior to the verification test. If the verification test reveals material that does not meet AASHTO M320 specifications, or shows a drop of $G^*/\sin(\delta)$ greater than 25%, the material that is represented by the sample will be rejected. If a random sample demonstrates acid modification, additional samples will be tested.
- (5) Supplier-submitted samples of binder proposed for use, can be tested for acid modification. Binders that demonstrate acid modification will not be accepted for use.
- (6) Lot samples of the binder shall meet or exceed the PG+ specifications as listed, in addition to AASHTO M320 specifications. For PG+, Table 1 specification testing, material will be tested on original unaged binder for phase angle specification, and RTFO aged material for elastic recovery. Project lot samples can also be tested for acid modification as described in VI.6.f.(4).
- (7) When it is determined that material exceeds Table 1, Table 2 will apply. When it is determined that a single sample(s) does not meet AASHTO M320 specifications, Table 3 will apply.
- (8) All project samples will be tested for original binder dynamic shear rheometry compliance.

- (9) Modified binders with a temperature spread of 104 shall be exempt of the AASHTO M320 requirement for the test of Viscosity, AASHTO T316.
- (10) All specified binders with a temperature spread of 92 or greater, shall be modified with an elastomer modifier as specified in paragraph VI.6.f.(1).

**Table 1
Additional Specifications for Modified Binders**

PG+ Specifications	Spec Base			Spec w/Tol. ²		
	92	98	104	92	98	104
Temperature Spread ¹						
Elastic Recovery; AASHTO T301 tested at 77°F (RTFO Aged AASHTO T301)	Minimum 65%			Minimum 60%		
Phase Angle; degrees (Maximum) (Original Binder)	77.0	75.0	73.0	79.0	77.0	75.0

¹ Temperature Spread is determined by subtracting the low temperature from the high temperature. Example (PG 64-28: 64 – (-28) = 92).

² Tolerances were determined from CSBG round robin data and AASHTO or ASTM precision statements. Material exceeding these tolerances is subject to 75% pay or removal.

**Table 2
PG + Single Sample Tolerance and Pay Factor Table**

	Pay Factor of 0.75 or Removal ¹		
Temperature Spread	92	98	104
Elastic Recovery Percentage (RTFO Aged AASHTO T301)	< 60%		
Phase Angle (degrees) (Original Binder)	> 79.0	> 77.0	>75.0

¹ Price Reduction will be applied to contract unit price of asphalt binder. The Engineer will determine if the non-compliant material will be removed. Removal and replacement will be at no additional cost to the Department. If the non-compliant material is accepted, a price factor of 0.75 will be applied. The price factor will be applied to the contract unit price of asphalt binder.

Table 3
Single Sample Tolerance and Price Factor Table

	Pay Factor of 0.75 or Removal ¹
<u>Tests on Original Binder</u> Dynamic Shear, $G^*/\text{Sin } \delta$, kPa	< 0.93
<u>Tests on Rolling Thin Film Oven Residue</u> Dynamic Shear, $G^*/\text{Sin } \delta$, kPa	< 1.98
<u>Tests on Pressure Aging Vessel Residue</u> Dynamic Shear, $G^*\text{Sin } \delta$, kPa	> 5600
<u>Creep Stiffness</u> S, mPa	> 325
m-Value	< 0.285

¹ Price Reduction will be applied to contract unit price of asphalt binder. The Engineer will determine if the non-compliant material will be removed. Removal and replacement will be at no additional cost to the Department. If the non-compliant material is accepted, a price factor of 0.75 will be applied. The price factor will be applied to the contract unit price of asphalt binder.

VII. Overall Project Average - Price Reduction Based on Complete M320 Testing

1. Binders that demonstrate acid modification as per VI.6.f.(4) shall be rejected, and the test results will not be included in Overall Project Averages.
2. PG+, Table 1 specifications do not apply to Overall Project Averages.
3. Out of specification material will be determined by the specifications outlined in AASHTO M320, excluding Direct Tension.
4. The Nebraska Department of Roads, Materials and Research Bituminous Laboratory, will do complete specifications testing on a minimum of two samples or 20% of the total samples from the project, whichever is the greatest. The Department will randomly select one sample for complete specifications testing out of every five samples received. When any test result shows a sample not meeting specifications, the previous and following sample received will also be tested for complete specifications compliance. Adjacent-sample testing will continue in this manner until tested samples meet all specifications, or there are no more lot samples to be tested.
5. Samples not selected for complete specifications testing are “control” samples. Control samples will be tested for AASHTO M320 Dynamic Shear, as well as PG+ phase angle if modified. When a control sample falls out of AASHTO M320 Dynamic Shear and/or PG+ phase angle specification, it will then be tested for complete M320 and PG+ specifications compliance. And, as mentioned in VII.4, adjacent samples will be tested when any results do not meet specification. Adjacent testing will continue until tested samples meet all specifications, or there are no more lot samples to be tested. This additional complete testing for M320 and PG+ compliance is in addition to the minimum number of samples that will be tested for complete M320 and PG+ compliance.

6. At the completion of testing, all M320 test results will be averaged. The average will not include M320 results from any binder lots that have already been reduced in pay by Table 3. For averages that do not meet M320 specifications, the largest reduction shown in Table 4 will be applied to all the Performance Graded Binder used on the project, with the exception of any binder lots that were already reduced in pay by Tables 2 and/or 3. In cases where there is only one PG Binder Grade lot sample left for determining the Overall Project Average tests results, that one sample will be used for Project Average Factor determination by Table 4.

**Table 4
Overall Project Average – Pay Factor Table**

	Range of Average	Pay Factor Applied
<u>Tests on Original Binder</u> Dynamic Shear, $G^*/\sin \delta$, kPa Min. 1.00 kPa	< 1.00 – 0.98	0.98
	< 0.98 – 0.96	0.95
	< 0.96 – 0.94	0.92
	< 0.94	0.85
<u>Tests on Rolling Thin Film Oven Residue</u> Dynamic Shear, $G^*/\sin \delta$, kPa Min. 2.20 kPa	< 2.20 – 2.156	0.98
	< 2.156 – 2.09	0.95
	< 2.09 – 2.024	0.92
	< 2.024	0.85
<u>Tests Pressure Aging Vessel Residue</u> Dynamic Shear, $G^*\sin \delta$, kPa Max. 5000 kPa	>5000 – 5100	0.98
	>5100 – 5250	0.95
	>5250 – 5400	0.92
	>5400	0.85
m-Value Min. 0.300	< 0.300 – 0.298	0.98
	< 0.298 – 0.293	0.95
	< 0.293 – 0.290	0.92
	< 0.290	0.85
<u>Creep Stiffness</u> S, mPa Max. 300 mPa	>300 – 306	0.98
	>306 – 315	0.95
	>315 – 324	0.92
	>324	0.85

VIII. Single Sample Reduction and Overall Project Average Reduction

A sample representing a lot, incurring pay reduction or removal by Table 2 and/or 3, will incur pay reduction or removal only for the material that the sample represents.

Only the largest overall project average reduction from Table 4 will apply when more than one test average falls out of AASHTO M320 specifications.

Pay Factors or removals, based on single sample test results, and pay factors based on overall project average test results, are separate from each other, and both will be applied.

IX. Investigation of Verification Lot Samples That Do Not Meet Specifications

When the lot sample shows test results out of specification limits, the process of resolving the sample failure will include the following actions, as appropriate:

1. The Bituminous Lab may conduct retesting of the remaining portion of the sample as determined necessary to confirm or disaffirm the original test result(s).
2. The Bituminous Laboratory will notify the NDOR project personnel, who will in turn notify the Contractor. All will arrange to investigate all aspects of the testing, loading, handling and delivery of the material in question. The Contractor and NDOR project personnel shall report findings to the Bituminous Laboratory.
3. The Bituminous Laboratory will collect and compile all information provided.
4. The Bituminous Laboratory will issue the standard report of tests for all samples tested, to include any resulting pay factor deductions or removals. A copy of the report of tests will be distributed to the District and Construction Division. The District will then provide a copy to the Contractor. Supplier requests for a copy of this report will be directed to the Contractor.

X. Dispute Resolution

After testing and investigations have been completed on the sample, and there is still a dispute, the NDOR will select an independent laboratory for referee testing to take place on the remainder of the sample, or any other representative samples obtained. The identity of the independent laboratory will not be revealed until the selected laboratory has completed the referee testing, and the NDOR has submitted a final report of the results. If the independent lab's tests indicate failing results and pay deductions equal to or greater than the NDOR's, the Contractor will reimburse the NDOR for the cost of testing. If the independent lab's tests indicate that the material meets specification or is at a pay deduction less than the NDOR's, the NDOR will assume the cost of testing. When the independent lab's tests indicate a pay deduction, the lesser of the NDOR's and the independent lab's deductions will be applied.

Only the Contractor can initiate dispute resolution, and request referee testing. The request must be made, in writing, to the NDOR Construction Division within 60 days of awareness of sample results. For any period of time past 60 days, dispute resolution is forfeited.