United States Department of the Interior
Bureau of Indian Affairs
Navajo Regional Office
P.O. Box 1060
Gallup, New Mexico 87305-1060

IN REPLY REFER TO:

NOTICE TO BIDDER: Your attention is directed to FAR Clause 52.229-03 entitled Federal, State, and Local Taxes. Local taxes are also to include the Navajo Nation Tribal Taxes for construction work on the Navajo Indian Reservation. Bidders are responsible to inquire of any and all Tribal Taxes that may be applicable to this solicitation. For more information regarding Tribal Taxes contact: The Navajo Nation, Office of the Navajo Tax Commission, P.O. Box 1903, Window Rock, Arizona, 86515, (928) 871-6681 or 6683.

SPECIFICATION FOR PROJECT: N35(9-1)4

FINISH GRADING, PLACEMENT OF AGGREGATE BASE COARSE, HOT ASPHALITIC CONCRETE PAVEMENT, AND MISCELLANEOUS CONSTRUCTION OF 10.25 km OF ROADWAY LOCATED IN SWEETWATER, ARIZONA, APACHE COUNTY, NAVAJO INDIAN RESERVATION

THIS PROJECT IS FOR A
P.L. 93-638 Contract

CONSTRUCTION TO BE PERFORMED ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS - "2003 EDITION"

ISSUED BY: NAVAJO REGIONAL OFFICE
GALLUP, NEW MEXIAO 87305
SECTION III - SPECIAL AONTRACT REQUIREMENTS
rev: July 17, 2012

Clause Number and Title — Page

SPECIAL AONTRACT REQUIREMENTS

1. Requirements for Execution of Surety Bonds

Each surety company bond (performance and payment) which purports to have been executed by an agent or attorney-in-fact, for the corporate surety, is required to have submitted with it a power of attorney to the signatory agent or attorney-in-fact, and executed by the corporate surety upon a date reasonably approximate to the date to the bond. Such power of attorney shall in each instance be retained with the bond.

2. Modification Proposal - Cost Breakdown

The Contractor, in connection with any proposal he makes for a contract modification, shall upon request furnish a price breakdown, itemized as required by the Contracting Officer/Awarding Official (AO) along with a complete breakdown of the original unit bid price as requested by the AO. Unless otherwise directed, the breakdown shall be in sufficient detail to permit an analysis of all material, labor, equipment, subcontract, and overhead costs, as well as profit, and shall cover all work involved in the modification, whether such work was deleted, added, or changed. Any amount claimed for subcontractors shall be supported by a similar price breakdown. In addition, if the proposal includes a time extension, a justification thereof shall also be furnished. The proposal, together with the price breakdown and time extension justification, shall be furnished by the date specified by the AO.

3. Contractor Safety Program Requirements

The Contractor shall establish a safety program, which shall include at a minimum the following requirements:

A) Safety Program Submittal:

Within 30 days following the awarding of a contract, the Contractor shall submit in writing to the Contracting Officer's Representative (AOTR) a proposed comprehensive safety program (in accordance with 48 CFR , Clause 52.236-13) for review for contract compliance. The Contractor's safety program shall show detail policies, procedures and plans that will be implemented to ensure the safety and health of employees and visitors at the job site. The Contractor shall prepare a list of major hazards associated with the contract work and provide in the safety program means to minimize the hazards.

B) Pre-Construction Safety Meeting:

A representative of the Contractor shall meet with AOTR and staff prior to the start of construction to review the safety program and discuss implementation of health and safety provisions pertinent to the work under contract. The Contractor should be prepared to discuss, in detail, the measures to be taken to control the hazards associated with the major phases of the work under contract. This meeting shall be devoted mainly to a discussion of the manner in which the Contractor intends to administer the health and safety program, delegation of responsibility for implementing the program, and a determination of what shall be presented in the written safety program.

C) Contractor Housekeeping Requirement:

Good housekeeping, including provision and facilities for routine scrap removal, shall be maintained in all areas within the Contractor's scope of operation. Any and all garbage shall be stored and removed to a certified landfill off the reservation.

D) Contractor Contamination Requirement:

Handling, storage, and disposal of hazardous materials of any nature shall be carried out in a manner so as not to contaminate or pollute public and/or private property, water supplies, rivers, lakes, reservoirs, streams, or the atmosphere. Disposal of all materials, including waste, garbage, and sewage, shall comply with all local, tribal, state, and federal regulations.

4. Hours and Days of Work

A. The performance time allowed under this contract is based on a forty-hour workweek. The Contractor shall provide a minimum **14**-calendar day **written** advance notice to the AO of the actual work schedule, affording adequate opportunity to respond and to schedule Government personnel. Work on Saturdays, Sundays, Government and/ or Tribal holidays is not contemplated, however the Contractor shall make every effort to inform (**in writing**) the Government of his intentions concerning work on weekends and/or holidays (at least 14 calendar days in advance) so that the Government may accommodate the work (requiring inspection and/or oversight) or respond otherwise.

The Contractor is required to update his construction schedule and submit to the AO for review and approval if the work outside the normal 40 hours workweek exceeds 2 weeks and it must be approved prior to the work beginning.

B. In no case shall work be performed on holidays and/or weekends without the approval of the AO. The Contractor shall be allowed to work on items of this contract that do not require government inspection and/or oversight at any time including Saturdays, Sundays, and holidays during the construction period shown herein provided the Contractor inform the AO in **writing** within the time frame specified above. Any costs associated with government inspections and/or oversight on weekends and holidays or as a result of contractor induced delays or mistakes in the work, shall be deducted from the progress payments in accordance with 4(C) below. The Contractor may dispute the deductions, in writing, to the Contracting Officer in accordance with 4(C).

Any quantities of work (as reflected in the bid schedule) that is completed outside the normal work week shall be measured and paid for at the contract unit price bid provided the work meets the requirements of this contract. However, with respect to the quality control item unless agreed to by the AO in writing quality control hours incurred as a result of contractor induced delays or mistakes will not be paid for.

C. The AOTR shall prepare a detailed breakdown of government expenses incurred as a result of government personnel working in excess of the normal 40 hour work week to accommodate the contractor and shall submit this report to the AO (with a copy to the contractor) for reimbursement through a progress payment adjustment. The AO shall notify the contractor 10 working days in advance of making the adjustment in the next progress payment so that the Contractor is given the opportunity to review the report and any expenses claimed. Should the Contractor dispute the government expense report, the disputed items shall be submitted to the AO in writing within the time frame given by the AO and the AO shall make a final determination (within 20 working days of receipt of the disputed items).

D. The Contractor shall submit to the AO the name and legal address of each supervisor to be employed under this contract prior to his entrance on duty. Copies shall be provided to the AO for their records.

5. Water

Water sources used for this project shall be subject to the laws and regulations imposed by the permitting agency. Any costs associated with obtaining such permits shall be borne by the Contractor. A copy of this permit shall be furnished to the AOTR prior to construction. In no case may sewer lagoon water be used until the Contractor can show that the water will comply with the requirements of the Navajo EPA and the Clean Water Act and that a testing procedure to follow is outlined in the overall safety plan to insure compliance.

6. Borrow and Aggregate Materials

Contractor Furnished Source:

The Contractor shall be solely responsible for the location, surveying, permits, and associated costs for all borrow and aggregate material sources either within or outside of any Indian Reservation. The Contractor shall provide copies of all permits to the AO through the AOTR for their records. All activities associated with borrow and aggregate material sources on the Navajo Reservation shall be subject to applicable Federal and Tribal laws. The Government is not responsible for the lack of material within the source to complete the items of work in this contract. All expenses associated with obtaining necessary permits shall be the contractor's responsibility. The contract time shall only be extended (under a negotiated written modification) if the Contractor in obtaining permits requiring Government review and/or approval, which delays the Contractor. A delay caused by Tribal or other local permitting processes is the responsibility of the Contractor. Written proof is required to substantiate any contractor delays.

The Contractor shall perform aggregate quality tests on three (3) representative samples (i.e. 3 samples for the Contractor and 3 for the Government) for each proposed source and for each change in source. A source is defined as the land area from which material will be removed and represented by the aggregate quality samples. The selection of samples representing the source shall be the responsibility of the Contractor including all associated equipment, and labor. The Contractor shall notify the AOTR before opening the test hole within the source so that the AOTR or his elected representative will have the opportunity to observe the test hole opening and subsequent sampling. The AOTR may perform verification testing on the Government's split samples, the costs of which shall be the responsibility of the Government.

The material sampled shall be tested by an AASHTO certified testing laboratory. The Contractor shall submit the test results to the AOTR. The cost of all sampling and testing shall be borne by the Contractor. The AOTR may direct the contractor to re-test the material source based on government test results. The costs of any re-testing shall be borne by the Contractor, unless such tests substantiate the contractor's original results, in which case the Government will reimburse the contractor for the costs of re-testing.

The Contractor shall be responsible for all testing during the crushing and screening operations.

Should the source contain insufficient material to meet the contract needs or should it become necessary for the Contractor, to change and/or select a new source, the Contractor shall be solely responsible for all costs and delays to the contract, unless such change is due to negligent actions of the Government.

The Contractor shall be solely responsible for obtaining archeological and environmental clearances for his haul roads, material sources, and construction yards including all permits and associated costs. The Contractor shall be responsible for providing adequate traffic control on all haul roads in accordance with the MUTCD latest edition. The Contractor shall construct and/or maintain all haul roads into and from the source to the project. Any existing Government owned roads damaged by the Contractor's negligence or failure to abide by load restrictions shall be restored to original condition at the Contractor's expense. All haul road construction, maintenance (including dust control), traffic control including flaggers, and

improvements will not be measured for payment but shall be considered a subsidiary obligation of the Contractor under the contract items requiring borrow and/or aggregate material.

The Contractor shall be solely responsible for obtaining archeological and environmental clearances for his plant site, haul roads, and construction yard including all necessary permits. The plant, haul roads, and construction yard development and maintenance shall not be measured for payment but shall be considered a subsidiary obligation of the Contractor under other contract items. Copies of such clearances and permits shall be furnished upon request of the AO.

Commercial and/or other Material Source:

The Contractor shall adhere to the requirements under these "Special Contract Requirements" with the following stipulations applied:

A. The Contractor shall advise the AOTR (at least 5 working days in advance) of materials to be furnished from commercial sources.

B. The Contractor shall, upon request, furnish aggregate quality test results from the proposed commercial source. This requirement will be considered fulfilled if the submittals for the product supplied contain the required information. The AOTR shall be afforded the opportunity to obtain verification test samples if requested.

7. Payment to Contractor

Payments to the Contractor shall be made within fourteen (14) calendar days after each progress pay estimate is approved by the AO. The progress pay estimate must include copies of the actual field book measurements taken, for each item of work requesting payment on, for verification by the AOTR Unless other methods of payment are agreed to in writing, it is the responsibility of the Contractor (Superintendent) and AOTR to agree upon the amount of work and/or quantities in place which will be the basis of progress payment invoicing (see section 109 of FP-03 supplemental specification). The Contractor (Superintendent) shall prepare a progress pay estimate, sign the estimate, and forward the estimate reflecting the agreed upon work for a given pay period to the AOTR. The AOTR will verify the pay estimate by signing and forwarding the estimate to the Contracting Officer within 3 working days of receipt. If the AOTR or Regional DOT Manager cannot validate the estimate, then the estimate shall be returned back to the Contractor for corrections and a new invoice prepared and submitted.

8. Determination and Extension of Contract Time

The **210 calendar** days allowed for the performance of the contract is based on the work to be performed and weather conditions that are normally anticipated in the area that may prevent work**.** The **210 calendar** days, required to complete the work, as specified takes into consideration **15** calendar days for weather conditions normal to the project area and provides adequate time for shutdowns during normal weather conditions including **1** winter suspension(s), and holidays. Time extensions because of weather conditions shall not be granted except in cases of unusually severe weather or "Acts of Nature" unanticipated by this contract.

The Contractor shall be required to obtain and submit, to the AO, climatological data for the area of the project, covering at least a ten year period, to receive consideration for any contention of unusually severe weather and time extension.

9. Certifications and Shop Drawings

Certifications: The Contractor will be required to furnish certificate(s) of compliance (i.e. production certification) along with valid test reports, for all cements, fly ash, precast products, PVC pipe, corrugated steel, structural steel and hardware, reinforcing steel, asphaltic materials, aluminum signing materials, pavement markings and paints, traffic sign paint, paints and coatings for structural steel, high strength bolts, seed, and other materials calling for painted surfaces, any other materials which require fabrication or materials taken from outside of the project limits, and for materials specifically requiring certificates of compliances by the construction plans or specifications. The Contractor shall be responsible to assure that the certificates of compliance have the following minimum requirements prior to submittal:

- the name and address of the manufacturer and/or supplier,
- the material production date,
- the project number (may be indicated on Contractor's cover letter),
- the contract number (may be indicated on Contractor's cover letter),
- a printed or written description of the end product or end use (as shown in the
- construction plans, specifications, or approved shop drawings),
- applicable sizes or dimensions of materials,
- printed or written statements as to what Contract specification the material is in conformance to (as specified in the FP-03, Contract plans and specifications, and/or approved shop drawings) with proper AASHTO or equivalent ASTM test results, heat numbers, and specified limits.

Certificates of compliance for material that do not conform to the specified AASHTO or equivalent ASTM specification shall not be submitted under the Submittal Transmittal Review and Approval Form, but shall be submitted by the Contractor under a Letter of Request for Substitution with justification to include a comparison of the proposed substitute material specification to the specified material specification showing equal to or better performance. The materials may not be used on the project until such time as the submission has been reviewed and accepted, in writing, by the Regional DOT Manager, through the AO as an equivalent substitution. The certificates of compliance shall be submitted directly from the supplier, through the Prime Contractor, to the Regional DOT Manager (via the AOTR) for review and approval prior to the materials being incorporated into the work. Certificates of compliance not containing all of the minimum requirements listed above, or certificates of compliance not conforming to the specified material specifications (i.e. substitutions) which are submitted under the Submittal Transmittal Review and Approval Form, will not be reviewed by the Government and will be returned to the Contractor as DISAPPROVED. Full payment will not be made for work incorporating materials that require certificates of compliance until the material supplied on the project is matched by heat number or other identifying number to approved certificates of compliance by Quality Control subcontractor and AOTR. Materials supplied on the project that cannot be matched by heat number or other identifying number to approved certificates of compliance, or that are incorporated into the work prior to certificate of compliance approval, shall not be paid for and may be rejected by the government.

The Contractor shall furnish product certifications for all other small quantity items which include fencing items, sign posts, delineators, object markers, reflective tabs, pavement markers, air entraining agents, concrete additives, joint materials, fertilizer, erosion control items, geotextiles, and any other products purchased off the shelf from a supplier. The certificates of compliance shall clearly identify the AASHTO/ASTM/or other specified standard test each product meets (as called for in the contract) as issued by the manufacturer.

Electrical items meeting UL approval, and underground utility materials meeting ASTM or AWWA specifications and so certified or stamped on the product, will require no further certificates of compliance.

The Contractor may furnish material purchased in bulk or left over from previous projects by submitting a product certification or certificate of compliance for the current project as outlined above.

The Contractor shall be responsible for verifying that material furnished and/or installed on the project site, or contained in items fabricated off site and shipped to the project site, are the same materials that are shown on the approved certifications. Verification shall be made by heat number, lot number, traceable paperwork, markings or other industry standard methods of material identification showing that the material is the same material shown on the approved certifications. Work containing material that is not verifiable as being covered by approved certifications may be disapproved and/or may be subject to non-payment. Verification shall be documented in the project record files.

Shop Drawings: The Contractor shall provide three (3) sets of shop drawings (Architectural D size) and one set of electronic files in AutoCAD 2011 or Microstation V8i compatible format on CD for all bridge structural members and hardware, guardrail and barriers, cattleguards and hardware, wing bracing, retained earth walls, and any pre-cast or fabricated concrete or steel materials called for in the contract for review and approval prior to fabrication directly to the Regional DOT Manager. The Contractor shall allow at least four (4) weeks, from the time the shop drawings are received, for review and approval. The Regional DOT Manager shall reply to the Contractor's shop plans either as "**Approved**", "**Approved as Noted**," or "**Disapproved**".

Review of any and all shop plans or drawings is rendered as a service only and is not considered a guarantee of measurements, quantities, and/or dimensions, nor shall it be considered as relieving the Contractor from complying with the contract specification and design plans.

Approval shall indicate that the Contractor may proceed to fabrication and/or construction.

Approval as Noted shall indicate that any and all noted changes, remarks, and/or corrections shall be addressed prior to proceeding to fabrication and/or construction, and a revised set of shop drawings showing the noted changes, remarks, and/or corrections submitted for Record.

Disapproved shall indicate that any and all changes, remarks, and/or corrections shall be addressed by the Contractor, and a revised set of shop drawings showing the noted changes, remarks, and/or corrections submitted for a subsequent review. The Contractor shall not proceed to fabrication and/or construction until the shop drawings are reviewed and receive an Approved or Approved as Noted status.

Do not use the "**Submittal Transmittal Review and Approval Form**" for submitting shop drawings, request for changes in requirements, or survey data submissions.

10. Furnishing of a Contractor Field Testing Laboratory

The Contractor shall furnish, at a location convenient to the project site or asphalt plant site, a field laboratory equipped with all necessary test equipment with accessories and all incidentals including utilities and sanitary facilities to satisfy the testing and inspection services required by this contract.

Use equipment that has been calibrated within the last 6 months of issuance of this contract, and that is applicable to the contract requirements. Tag all necessary equipment indicating the date of last inspection, inspector, and calibration number.

The laboratory, utilities (including all associated monthly costs), accessories, and all equipment required by the contract requirements including furnishing of a laboratory site shall be included in the unit price

bid for mobilization or applicable bid item for quality control sampling, testing, and inspection as reflected in the bid schedule.

No work requiring testing shall be permitted until the Contractor has furnished the above and the laboratory is ready to accept samples for testing by furnishing the following:

1. Description of the calibrated equipment including calibration number, model number, serial number and/or other acceptable identification.

2. Identification of the individual(s) who performed the calibration of the equipment.

3. Description of the procedure used to calibrate all the equipment to be used on this contract.

11. Furnishing of Field Office and Sanitary Facilities

The Contractor shall furnish, at locations convenient to the project site, one weatherproof building for the exclusive use of Government personnel for use as a field office. The building shall have, as a minimum, outside dimensions of 8 feet in width by 30 feet in length having a minimum ceiling height of 7 feet, at least two operable windows and two lockable doors, and adequate supply of 110 volt, 60 cycle electricity and phone service line with fax capability for lighting, operating of office and computer equipment, communications, and shall be heated and air-conditioned as required by the AOTR. Portable toilet facilities, serviced at least weekly, shall be furnished by the Contractor and removed when no longer required. In addition to the above general requirements for the building, the Contractor shall furnish a water supply for drinking, which shall be delivered either in a continuous pressurized system or an elevated gravity flow system of adequate capacity to fully support the facility being provided. The furnishing of the above facility (including utilities) shall be included in the unit price bid for mobilization.

12. Asphalt Shipments

All asphalt shipments to the project shall be in sealed tankers and this seal shall **only** be removed by an authorized representative of the Quality Control Manager. Any tanker with a broken seal or no seal shall be rejected and removed from the project.

When the bid schedule calls for payment of bituminous materials by the ton, the quantity used shall be determined by certified weight tickets accompanying each load subject to correction when bituminous material has been lost, wasted, or otherwise not incorporated into the work. Asphalt shipments shall be weighed across the project scales before and after unloading when requested by the AOTR. Should the project scales determine a weight less than the certified weight tickets show, the lesser quantity will be the pay quantity. Each weight ticket shall be clearly referenced to accompanying bill of lading and certified laboratory analysis report.

13. Load Restrictions

The total gross vehicle weight imposed on this project under this contract or any other Navajo Region route by any vehicle or combination of vehicles shall be as follows:

The Navajo Nation has adopted vehicle weight limits that are more restrictive than those in the states of New Mexico, Utah, and Arizona. The weight limits of the Navajo Nation shall apply to all BIA Navajo Regional roads and bridges within the Navajo Reservation unless a lesser limit is posted; then the lesser limit shall apply regardless of when the lesser limit was posted. Under certain circumstances, these limits may be exceeded, but only when the Contractor has applied for and received an approved permit to do so

issued by the BIA Navajo Regional Office, Division of Transportation. The Contractor may make application for a permit to exceed weight limits from the Regional Road Maintenance Engineer.

The State and Counties respective laws set the weight limits for roads under the jurisdiction of the counties and states. The Contractor is required to haul within these limits unless he has a permit from the applicable jurisdiction to haul above those limits. The Contractor shall be solely responsible for all damages to roads and bridges caused by hauling above the legal limits including any Subcontractors under this contract. All damages, regardless of jurisdiction, shall be repaired at the Contractor's expense to the satisfaction of the owner's standards and/or directives.

Title 14 - Chapter 4, Sections 607 & 608 of the Navajo Tribal Code as it relates to vehicle load limits is referenced (in metric) herein for the Contractor's convenience.

Section 607. Load limits on Single-axles, wheels and tires

a) The gross weight imposed on the highway by the wheels of any one (1) axle of any one (1) axle of a vehicle shall not exceed 9809 kg, nor shall any one (1) wheel carry a load in excess of 4995 kg. A tandem axle **cannot** carry load in excess of 15,585 kg.

b) No wheel equipped with pneumatic, solid rubber, or cushion tires shall carry a load in excess of 272 kg for every 25mm of tire width. The width of pneumatic tires shall be taken at the manufacturer's rating. The width of solid rubber and cushion tires shall be measured at the flange of the rim.

Section 608. Gross weight of vehicles and loads

(a) Subject to the weight limits imposed in section 607, the total gross weight with load of a vehicle or combination of vehicles with two or more consecutive axles shall not exceed the gross weight given for the respective distance between the first and last axles of measured longitudinally to the nearest 0.3 meters, as set forth in the following table:

Distance (D)	Load (L)	Distance (D)	Load (L)	Distance (D)	Load (L)
1.2	14,512	2.7	15,419	4.3	19,592
1.5	14,512	3.0	15,873	4.6	19,955
1.8	14,512	3.3	16,190	4.9	20,317
2.1	14,512	3.7	16,508	5.2	20,680
2.4	14,966	4.0	16,825	5.5	21,043

D = Distance in meters (m) between first and last axles of group of axles.
L = Allowable load in kilograms (kg) on group of axles.

(b) The total gross weight with load imposed on the highway by any vehicle or combination of vehicles where the distance between the first and last axles is more than 5.45 meters shall not exceed that given for the respective distance given in the following table:

Distance (D)	Load (L)	Distance (D)	Load (L)	Distance (D)	Load (L)
5.8	21,406	8.8	26,599	11.9	30,839
6.1	21,769	9.1	26,984	12.2	31,746
6.4	22,131	9.4	27,370	12.5	32,653
6.7	22,494	9.7	27,755	12.8 – 15.5	32,780
7.0	22,857	10.0	28,140	15.8	33,379

7.3	23,220	10.4	28,526	16.1	33,741
7.6	25,057	10.7	28,911	16.4	34,104
7.9	25,442	11.0	29,297	16.8	34,467
8.2	25,828	11.3	29,682	17.0 & over	34,830
8.5	26,213	11.6	30,068		

D = Distance in meters (m) between first and last axles of vehicle.
L = Allowable load in kilograms (kg) of vehicle.

(c) The distance between axles shall be measured to the nearest (0.3m). When s fraction is exactly one-half foot (152mm) the next larger whole number shall be used.

The Contractor shall be responsible for all damages caused by his or her supplier's hauling units on any State and Bureau owned highway. All damages shall be repaired at the Contractor's expense to their original condition.

14. Plans and Specifications

Due to excessive costs incurred by the Government in printing, the Government will no longer be providing plans and specifications for its projects to suppliers and/or subcontractors. Only one set of C size plans and contract specifications will be provided to each bidder. The Government shall provide a maximum of 5 full size (Architectural D size) or 5 half size (Architectural C size) sets of plans upon request to the Contractor who is awarded a contract. In addition or in lieu of plans sets, the Government shall furnish one full sized and/or one half-size set of reproducible or electronic media in Acrobat (*.PDF) or AutoCAD Release 2011 format from which the Contractor may produce hard copy drawings.

Any Prime Contractor bidding on Government contracts is responsible for providing its Subcontractors and Suppliers with information relating to their respective disciplines for cost proposals. Any misinterpretation or incorrect bids made to the Prime Contractor by the Subcontractor or Suppliers will not relieve the prime Contractor of his obligation to honor the contract and bid proposal.

15. Archeological Requirements

The Contractor shall be responsible for all environmental and archaeological requirements as outlined in both the Navajo Nation Historic Preservation (HPD) Office Programmatic Agreement for archeological discovery procedures, and NEPA regulations as may be described in this contract and/or shown on the design plans. Archeological sites shown on the plans are not to be disturbed by any construction equipment. The Contractor shall insure that no equipment comes within 5 meters of any known sites identified on the plans.

16. **Construction Requirements:**

A. The contractor is not permitted to park heavy equipment within 15 meters of existing drainage washes to prevent the leakage of oils or other toxic materials from entering the waters of the United States. The contractor is required to inspect all heavy construction equipment each day to insure all equipment is free of leaks and have a mitigation plan in place in case a toxic spill does occur. Any inadvertent discharge of toxic materials by the contractor's equipment and operations shall result in an immediate halt of work until the Contractor cleans up all spills and/or leaks in accordance with the EPA regulations at his

entire expense. The Contractor shall also be required to immediately notify the BIA Safety Officer and Navajo Regional Environmental Scientist when such spills or leaks occur.

B. All pipe installations shall be performed during low to no flow periods of runoff to minimize water quality impacts to the fullest extent possible.

C. In no case shall any finish grading or other ground disturbing work begin until the contractor's Storm Water Pollution Prevention Plan has been reviewed, accepted through the AO and implemented by the Contractor as may be required in the bid schedule. The Contractor is required to file a Notice of Intent with USEPA on the forms provided in Section (K) and as discussed in paragraph (17) below. The Contractor shall provide copies of the approved SWPPP to the Navajo Nation Environmental Protection Agency (NNEPA). The Contractor can request to have the BIA Force Account (FA) SWPPP remain in place until the work herein is completed. In this case, the Contractor will be responsible for removing the (FA) SWPPP features and disposing of them unless the AOTR directs the Contractor otherwise.

D. Waste concrete and/or hot mix shall be disposed of in accordance with EPA regulations off the project site. No dumping of waste concrete will be allowed on the project site unless authorized by the AO and a detailed plan for storing waste on the project is submitted for review and approval. Such plan must include a properly designed, lined, and maintained containment pit located on high flat ground at least 15 meters from any drainage washes and other environmental/ archeological sites as shown on the design plans. Any and all waste, excess concrete, and asphalt materials stored in a containment pit will be disposed of (off site) in accordance to EPA, state, and tribal regulations and the FP-03.

E. The Contractor shall provide a parking area for employee’s private vehicles. Private vehicles are not to be parked within the road right-of-way that is open to public traffic nor shall they be parked within 15 meters of drainage washes or known archeological sites. Vehicles may be parked outside the right-of-way limits provided the Contractor is given permission by the land user or tribe or may park the vehicles within the Contractor’s construction yard.

F. No work involving testing and inspection may take place until the Contractor’s Quality Control Plan is reviewed and accepted by the Regional DOT Manager.

G. The Contractor shall coordinate all utility relocations (where applicable) with the utility owners in accordance with section 107.02 as incidental obligations under this contract.

H. The Contractor shall stockpile the existing top soil for use in re-vegetation of borrow pits and roadway slopes to the fullest extent possible when required in the bid schedule or other permit requirements issued under tribal regulations.

I. The Contractor’s camp site and construction yard shall be kept clean and free of litter at all time to prevent debris and litter from entering bodies of water. All trash will be disposed of in accordance with EPA, state, and tribal regulations and all camp sites and

construction yards shall be restored to their pre-construction condition or better at project completion in conformance with the permit requirements and tribal laws.

J. Oils, lubricant, fuel, and hydraulic fluids shall be stored in sealed containers or in facilities that meet EPA regulations for prevention of environmental contamination.

K. Any welding (except tack welding) on any structural member (member designed to carry or resist traffic or pedestrian loads) shall be subject to visual inspection and magnetic particle testing by an AWS Certified Welding Inspector, and shall pass testing prior to acceptance of the work unless otherwise directed by the AO. All inspection, equipment, materials and incidentals required for the testing, inspection, and reporting by an AWS Certified Welding Inspector shall be included in the unit price bid for Bid Item 15301-0020.

L. Other requirements as outlined in Section (k) of this contract.

M. **Substantial Completion** will ONLY be given by the AO when the project is complete such that it can be safely and effectively used by the public without further delays, disruption, or other impediments as recommended by the AOTR during a substantial completion inspection. For conventional highway work, this is the point at which all road grading, pavement structure, shoulder, drainage, permanent signing and markings, traffic barrier, safety appurtenance, and utility work is complete and meets all the contract requirements.

N. **Final Acceptance** will be given when all work is completed (including any punch list of items) and the AOTR determines and schedules a final acceptance inspection with the Contractor, AO, and Regional DOT Representatives as appropriate. With the exception of any work accepted as final, in writing by the AO, the Contractor is still responsible for all the work until a final acceptance is given by the AO based on recommendations from the AOTR.

17. Environmental Requirements:

Certain environmental clearances and permits are attached in Part VII, Section (k) of these contract documents as reflected in the design plans in accordance with section 107.01. The Government shall be responsible for those mitigation measures required by the NEPA documents that are not covered in this contract. The Contractor is responsible for all environmental permits associated with the Contractor's construction operations.

Both the Contractor and AOTR are jointly responsible for filing **Notice of Intent** (unless otherwise directed by the AO or as defined elsewhere in this contract) under the National Pollution Discharge Elimination System (NPDES) permit requirements to USEPA. Under this permit process the contractor is required to and shall:

A. Prepare for review and approval, by the AOTR & Regional DOT Manager, a Storm Water Pollution Prevention Plan (SWPPP) per section 157 and the requirements in section (k).

B. When the SWPPP is approved, the AOTR will file **Notice of Intent** as the owner and a copy of the notice shall be provided to the contractor to file with his Notice.

C. Once the Contractor receives notice that his SWPPP is approved, he shall, with assistance from the AOTR, prepare the contractor NPDES Permit **Notice of Intent** form and shall submit to the USEPA along with the AOTR's **Notice of Intent** form no later than 48 hours prior to beginning of actual construction. The address is as follows:

Regular U.S. Mail Delivery

Storm Water Notice of Intent
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue
Washington, DC 20460

Overnight/Express Mail Delivery
Storm Water Notice of Intent
Room 7329
U.S. EPA
1201Constitution Avenue
Washington, DC 20004

The USEPA will mail back a copy of the permit for the project and a copy shall be furnished to the AOTR and Regional DOT Manager to insure compliance.

D. At completion of the project and final inspection has been performed, the Contractor shall then prepare and submit to the USEPA a **Notice of Termination** with a copy submitted to the AOTR and Regional DOT Manager to insure compliance.

(Note: The above mentioned forms obtained and submitted from the USEPA's home page on the Internet: **http://www.epa.gov/npdes/stormwater/cgp**) and the central data exchange: **https://cdx.epa.gov/epa_home.asp**

BID SCHEDULE
UNIT PRICE SCHEDULE
SCOPE-OF-WORK

The bid must be submitted on the Unit Price Schedule without modification.

The proposed work consists of furnishing all labor, material, equipment and incidentals necessary for construction of 10.25 kilometers of road reconditioning, aggregate base course and paving, single span, prestressed concrete girder with composite concrete deck bridge and miscellaneous construction in accordance with the FP-03 specifications and design drawings for Project N35(9-1)(2)4 in and near Sweetwater, AZ.

The quantities listed for each Item are estimated and the Unit Price is applicable to each item as given in the Bid Schedule below. The final pay quantity measurements shall be rounded to the significant figures given in this Bid Schedule for the final pay estimate.

Payment for work performed on Items furnished will be made in accordance with Sub-Section 109.05, Scope of Payments of FP-03.

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
10901-0000	Extra and Miscellaneous Work Authorized under Section 109.02(m)	All Req'd	Lump Sum	$100,000.00	$100,000.00
15101-0000	Mobilization	All Req'd	Lump Sum		
15201-0000	Construction Survey and Staking	All Req'd	Lump Sum		
15301-0020	Contractor Quality Control	6,621	Man-Hour		
30101-2000	Untreated Aggregate Base Course	45,568	Metric ton		
3030-6000	Roadway Reconditioning	10.25	Km		
40201-0500	Hot Asphalt Concrete Pavement, Class B, Grading B, Type III Smoothness	21,384	Metric ton		
40502-0800	Asphalt Binder, Grade PG64-22	1,283	Metric ton		
41101-5000	Prime Coat, Grade MC-70 or Approved Equivalent	147	Metric ton		
60405-0000	Manhole Adjustment	1	Each		
61901-1000	Barbed Wire Fencing, 5-Strand	20,858	Meters		
61902-1400	Gate, Type I	13	Each		
61903-0250	Cattleguard, 2 Unit 4500mm width with Type II Gate	7	Each		
61903-0710	Cattleguard, 3 Unit 7000mm width with Type II Gate	6	Each		
61903-1000	Cattleguard, 4 Unit 9000mm width	3	Each		

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
62101-0000	Right Of Way Monument	38	Each		
62102-0000	Reference Marker	38	Each		
62510-1000	Seeding, Dry Method	30.5	Hectare		
63302-0002	Sign Installation, 1 Post & Hardware: 3.35 kg/m	12.42	Square Meter		
63302-0003	Sign Installation, 1 Posts & Hardware: 4.10 kg/m	3.84	Square Meter		
63302-0010	Sign Installation, 2 Posts & Hardware: 2.98 kg/m	30.86	Square Meter		
63302-0011	Sign Installation, 2 Post & Hardware: 3.35 kg/m	2.57	Square Meter		
63302-0012	Sign Installation, 2 Posts & Hardware: 4.10 kg/m	2.04	Square Meter		
63309-0010	Delineators, Glass Fiber, Type 1a	36	Each		
63309-0020	Delineators, Glass Fiber, Type 1b	99	Each		
63401-1510	Pavement Markings, Type "H", Solid Yellow	7,381	Meter		
63401-1520	Pavement Markings, Type "H", Solid White	19,985	Meter		
63401-1610	Pavement Markings, Type "H", Broken Yellow	7,647	Meter		
63501-0000	Temporary Traffic Control	All req'd	Lump Sum		
63506-0500	Temporary Traffic Control, Flagger	2800	Man-Hour		
Total Contract Work……..					

SECTION K
Environmental & Archeological Clearance Requirements
R/W Terms & Conditions

Archeological compliance

M-4 The site will be avoided by constricting ROW width to 100 feet (50 feet right and left of centerline). Install permanent fencing along the 50 foot ROW west of centerline prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist.

M-5 The site will be avoided by constricting ROW width to 100 feet (50 feet right and left of centerline), insuring that the east edge of the 100 foot ROW coincides with the east edge of the existing road. Install permanent fencing along both sides of the 100 foot ROW (east and west of centerline) prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist.

M-6 The site will be avoided by constricting ROW width to 100 feet (50 feet right and left of centerline), insuring that the west edge of the 100 foot ROW coincides with the west edge of the existing road. Install permanent fencing along the new ROW west of centerline prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist.

In accordance with stipulations 3g and 5 of the document entitled *A Programmatic Agreement Among the Navajo Nation, the Bureau of Indian Affairs-Navajo Area Office, the Advisory Council on Historic Preservation, the Arizona State Historic Preservation Officer, the New Mexico State Historic Preservation Officer, and the Utah State Historic Preservation Officer for Cultural Resource Management Projects Conducted Under the Auspices of the Navajo Nation Historic Preservation Department, Roads Planning Section, Within the Boundaries of the Navajo Nation*, the ACHP, Arizona SHPO, and interested parties will be provided with determinations of effect and copies of treatment plans.
BIA shall insure adherance with these conditions of compliance. A report documenting the result of monitoring activity shall be submitted to NNHPD within 100 days of the completion of monitoring activities on the project. In the event of a discovery ["discovery" means any previously unidentified or incorrectly identified cultural resources including but not limited to archaeological deposits, human remains, or locations reportedly associated with Native American religious/traditional beliefs or practices], all operations in the immediate vicinity of the discovery must cease and the Navajo Nation Historic Preservation Department must be notified at 602-871-7132.

FORM PREPARED BY: Karen Benally//FINALIZED:PTN 3/20/95

Notification to Proceed
Recommended: Yes X No ___
Conditions: Yes X No ___

Alan S. Downer
Navajo Nation Historic Preservation Officer

3/24/95
Date

Agency Approval: Yes ℓ No ___

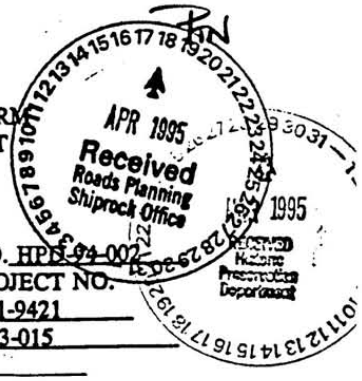
Area Director

3/25/95
Date

COMPLETED

FILE COPY

CULTURAL RESOURCES COMPLIANCE FORM
HISTORIC PRESERVATION DEPARTMENT
P.O. BOX 4950
WINDOW ROCK, ARIZONA 86515



ROUTING: COPIES TO
Arizona SHPO (Form Only)
X ACHP
X REAL PROPERTY MGT/330
X BIA-NAO-BOR (Attn: Burt Lessor; form only)
ALL Interested Parties
X NNHPD—Roads Planning

NNHPD NO. HPD-94-002
OTHER PROJECT NO.
PIII-5047-01-9421
BIA/BOR-93-015

PROJECT TITLE: *Archaeological Inventory and Ethnographic Assessment Along Navajo Route 35(1), 351(1), and 5037, Rock Point to Red Mesa and Immanuel Mission Spur Road, Apache County, Arizona, Volumes I-IV.* Cultural Resource Report 5047-01-9421; and *A Cultural Resources Inventory for BIA Roads Project N351(1) and N5037, Emmanuel Mission and Spur, Apache County, Arizona.* BIA/BOR-93-015.

LEAD AGENCY: Bureau of Indian Affairs, Navajo Area Office, Branch of Roads

SPONSOR: Wilfred Frazier, Bureau of Indian Affairs, Navajo Area Office, Branch of Roads

PROJECT DESCRIPTION: The BIA plans to grade, drain, and surface Navajo Route 35(1) from U.S. Highway 191 in the community of Rock Point, Arizona, northeast to U.S. Highway 160 near Red Mesa Trading Post, in Red Mesa, Arizona, covering a distance of 27.19 miles (43.5 km). They also plan to grade, drain, and surface the Immanuel Mission Spur Road which begins 0.13 km southeast of the Immanuel Mission on Navajo Route 5037, merges with Navajo Route 351(1) near the mission, and ends at its junction with Navajo Route 35(1), covering a total distance of 4.54 miles (7.3 km). The project is located on Navajo tribal trust lands in Apache County, Arizona, and is under the jurisdiction of the Shiprock Agency. P-III Associates (1994) surveyed a 200-ft-wide corridor along N35(1). Two bridge sites were also surveyed, encompassing a 600-ft-wide survey corridor, to be constricted to no more than 400 feet during construction. The N351(1)/5037 corridor was surveyed by Yazzie, et.al. (1993). Yazzie et.al (1993) recorded two (2) isolated occurrences; this was later amended to include one (1) site. P-III Associates (1994) conducted an ethnographic assessment of the N351(1)/5037 corridor and recorded three additional archaeological sites which were identified by the ethnographer; they did not resurvey the route. The construction corridor along N351(1)/5037 will be limited to 100 feet. Although portions of the project follow the existing alignment, the proposed N35(1) road deviates from the alignment in numerous locations. The N351(1)/5037 follows the existing alignment for the most part. It is anticipated that the project will entail considerable movement of earth and the use of heavy earth-moving equipment. Construction activities will include extensive above and below ground disturbance. Easements for haul roads, detours, turnouts, and borrow pits were *not* surveyed along either alignment. Such easements shall be subjected to separate Section 106 and/or NNCRPA review and consultation.

LAND STATUS: Navajo Tribal Trust

CHAPTER(S): Red Mesa, Arizona (Note: Although project is not within the Red Mesa Chapter, residents from this community were among those interviewed as land users.)
Sweetwater, Arizona
Rock Point, Arizona

LOCATION:

N35(1): U.S.G.S. 7.5' quadrangles for Rock Point, Arizona (1968); Dancing Rocks, Arizona (1969); Hogansaani Spring, Arizona (1968); Walker Butte, Arizona (1982, Provisional); and Toh Atin Mesa East, Arizona-Utah (1982, Provisional)

B.O.P. T38N, R25E, Sec. 3, unplatted
UTM Zone 12, 4065240N, 622370E
E.O.P. T41N, R28E, Sec. 16, unplatted
UTM Zone 12, 4091480N, 646800E

N351(10/5037: U.S.G.S. 7.5' quadrangle for Walker Butte, Arizona (1982, Provisional)

B.O.P. T39N, R27E, Sec. 11, unplatted
UTM Zone 12, 4072940N, 643580E
E.O.P. T40N, R27E, Sec. 25, unplatted
UTM Zone 12, 4078840N, 643460E

PROJECT ARCHAEOLOGIST: Betsy L. Tipps, Beth E. King, Robert I. Birnie, Susan C. Kenzle, and Daniel K. Newsome; P-III Associates, Inc.; Salt Lake City, Utah 84115-2932 and Dennis Yazzie, Harold Yazzie and Dwayne Waseta; Navajo Nation Historic Preservation Department-Roads Planning Program; Window Rock, Arizona.

NAVAJO ANTIQUITIES PERMIT NO.:
P-III Associates, Inc: B9487 (June 27, 1994 through December 31, 1994)
NNHPD-Roads Planning Program: NTC

DATE INSPECTED:
P-III Associates, Inc: June - November 1994
NNHPD-Roads Planning Program: 21 August 1993

DATE OF REPORT:
P-III Associates, Inc.: November 1994
NNHPD-Roads Planning Program: December 1993

TOTAL ACREAGE INSPECTED:
N35(1): 677.52 ac. (project area) plus 15.9 ac. in reroutes and 25.6 ac. for site boundaries beyond ROW

N351(1)/5037: 55.03 ac. (project area) Note: 4.8 ac. were inspected by P-III within 3 sites, with boundaries extending outside the ROW; 89.92 ac. were inspected by Yazzie et.al (1993) and 55.03 ac. were inspected by the P-III ethnographer.

METHOD OF INVESTIGATION:

Archaeology: P-III Associates, Inc: Class III pedestrian inventory with transects spaced 15m apart. NNHPD-Roads Planning Program: Class III pedestrian inventory with transects spaced 10m apart.

Ethnography: Contact with Chapter officials at all three chapters; announcements at chapter meetings; informal meetings with Chapter Coordinators/Managers and/or Planning Committee members at each chapter; systematic ethnographic field survey including interviews with all grazing permit holders, recommended knowledgeable people, and households within view of the project area. A Navajo-speaking cultural specialist served as interpreter for all interviews. Interviews were conducted using a modified *Navajo Nation Historic Preservation Department Sacred and Traditional Places Documentation Form* (NNHPD 1991). Locational and family information was collected on gravesites. Traditional Cultural Properties were documented on NNHPD site management and survey forms.

LIST OF CULTURAL RESOURCES FOUND:

N35(1)

AZ-I-6-36	Pre 1860s to 1960s historic road
AZ-I-6-37	TCP: sand gathering area
AZ-I-6-38	Post-1910 to pre-1940s Navajo habitation
AZ-I-6-39	Multi-component: (1) unknown prehistoric buried stains and (2) PII-PIII lithic and sherd scatter with features
AZ-I-12-23	Multi-component: (1) unknown prehistoric lithic source area and lithic scatter and (2) modern Navajo isolated features
AZ-I-12-24	1929 to 1990s Navajo habitation/ceremonial site
AZ-I-12-25	Multi-component: (1) unknown prehistoric lithic scatter and (2) 1937-1938 (?) Navajo trash scatter with features
AZ-I-12-26	1930s to 1950s Navajo habitation and Navajo burial
AZ-I-12-27	Late 1930s to 1990s Navajo habitation
AZ-I-12-28	Early 1900s to 1950s Navajo habitation
AZ-I-12-29	Unknown prehistoric lithic scatter with feature
AZ-I-12-30	Unknown prehistoric lithic scatter with possible features
AZ-I-12-31	Multi-component: (1) unknown prehistoric lithic scatter and (2) pre-1940s(?) to 1950s+ Navajo habitation [NOTE: archaeological data indicates 1950s+; tenuous ethnographic information suggests possible earlier use date]
AZ-I-13-01	Unknown prehistoric lithic scatter with feature
AZ-I-13-02	Unknown prehistoric lithic scatter
AZ-I-13-03	Multi-component: (1) Archaic lithic scatter, (2) Basketmaker III to P-I lithic and sherd scatter, (3) pre-1945 to 1970s Navajo habitation, and (4) 1950s to 1960s Navajo trash scatter
AZ-I-13-04	Multi-component: (1) Archaic lithic scatter with feature and (2) modern Navajo dump
AZ-I-13-05	Unknown prehistoric lithic scatter
AZ-I-13-06	Unknown prehistoric lithic scatter
AZ-I-13-07	Unknown prehistoric lithic scatter with feature
AZ-I-19-03	1935 to 1960s (with possible earlier occupations) Navajo habitation/ceremonial area

AZ-I-20-07	Multi-component: (1) unknown prehistoric lithic source area and lithic scatter, (2) PII-PIII sherd scatter, and (3) 1950s to 1990s Navajo dump
AZ-I-20-08	Multi-component: (1) Unknown prehistoric lithic source area and lithic scatter and (2) Basketmaker III-PIII lithic and sherd scatter with feature
AZ-I-20-09	PI-PII sherd and lithic scatter with features
AZ-I-20-10	PI-PII sherd and lithic scatter
AZ-I-20-11	Basketmaker III to PI sherd and lithic scatter with features
AZ-I-20-12	Multi-component: (1) Basketmaker III to PII architectural site, (2) post-1970 Navajo trash scatter with possible feature, and (3) 1960s Navajo burial
AZ-I-20-13	Multi-component: (1) PII sherd and lithic scatter and (2) modern Navajo trash scatter
I.U.A. 1	1960s to present modern dump
I.U.A. 2	1960s to present target and adolescent recreation area
I.U.A. 3	1860s to present east-west trending wagon trail/two-track road, parts of which have eroded beyond recognition, associated with modern trash
I.U.A. 4	1960s to present modern dump, officially designated as the dump for the Sweetwater Chapter in the 1980s, with associated access road
I.U.A. 5	Pre-1860 to present wagon trail/two-track road, associated with modern trash
I.U.A. 6	in-use homesite and ceremonial area, with primary features outside ROW. In-use outhouse and trash scatter located within ROW.

Isolated occurrences: 34
Historic Navajo gravesites: 6 (2 included within sites listed above)

N351(1)

AZ-I-12-34	1920s to 1970 Navajo habitation site with Navajo burials
N351-1	PII-PIII habitation

Isolated occurrence: I.O.# N351-1
Historic Navajo gravesites: 4 (1 included in site AZ-I-12-34 listed above)

N5037

AZ-I-12-32	Unknown prehistoric lithic scatter with features
AZ-I-12-33	Unknown prehistoric lithic scatter with features

Isolated occurrence: 1 [recorded by Yazzie et.al (1993); re-recorded by P-III Associates as AZ-I-12-33]
Historic Navajo gravesites: 2

LIST OF ELIGIBLE PROPERTIES:

AZ-I-6-36	
AZ-I-6-37	
AZ-I-6-38	
AZ-I-6-39	Components 1 and 2
AZ-I-12-23	Component 1

AZ-I-12-24	
AZ-I-12-25	Component 1
AZ-I-12-26	Includes G-4 as an integral part of the site.
AZ-I-12-27	
AZ-I-12-28	
AZ-I-12-29	
AZ-I-12-30	
AZ-I-12-31	Component 1
AZ-I-12-32	
AZ-I-12-33	
AZ-I-12-34	Includes M-2 as an integral part of the site.
AZ-I-13-01	
AZ-I-13-02	
AZ-I-13-03	Components 1, 2 and 3
AZ-I-13-04	Component 1
AZ-I-13-05	
AZ-I-13-06	
AZ-I-13-07	
AZ-I-20-07	Components 1 and 2
AZ-I-20-08	
AZ-I-20-09	
AZ-I-20-10	
AZ-I-20-11	
AZ-I-20-12	Component 1
AZ-I-20-13	Component 1
N351-1	NOTE: May be the same as site AZ-I-12-16, recorded by Cleveland (1993)
I.U.A. 3	
I.U.A. 5	

LIST OF NON-ELIGIBLE PROPERTIES:

AZ-I-12-23	Component 2
AZ-I-12-25	Component 2
AZ-I-12-31	Component 2
AZ-I-13-03	Component 4
AZ-I-13-04	Component 2
AZ-I-19-03	NOTE: eligibility determination based on information provided by users regarding the integrity of the site; users also requested that the site be destroyed]
AZ-I-20-07	Component 3
AZ-I-20-12	Components 2 and 3
AZ-I-20-13	Component 2
I.U.A. 1	
I.U.A. 2	
I.U.A. 4	
I.U.A. 6	
I.O. 1-34 along N35(1)	

I.O.# N351-1
Gravesites G-2, G-3, G-5, and G-6
Gravesites M-1, M-3, M-4, M-5, and M-6

LIST OF ARCHAEOLOGICAL RESOURCES:

AZ-I-6-39	
AZ-I-12-23	Component 1
AZ-I-12-25	Component 1
AZ-I-12-29	
AZ-I-12-30	
AZ-I-12-31	Component 1
AZ-I-12-32	
AZ-I-12-33	
AZ-I-13-01	
AZ-I-13-02	
AZ-I-13-03	Components 1 and 2
AZ-I-13-04	Component 1
AZ-I-13-05	
AZ-I-13-06	
AZ-I-13-07	
AZ-I-20-07	Components 1 and 2
AZ-I-20-08	
AZ-I-20-09	
AZ-I-20-10	
AZ-I-20-11	
AZ-I-20-12	Component 1
AZ-I-20-13	Component 1

N351-1 (assumed to be AZ-I-12-16)

EFFECT/CONDITIONS OF COMPLIANCE:

The proposed undertaking will have *no adverse effect* on historic properties provided all organizations involved in the project adhere to the following stipulations to avoid, minimize, or mitigate effects:

AZ-I-6-36 The project will have no effect on those characteristics that make the site eligible to the National Register of Historic Places.

AZ-I-6-37 At the request of users, no action shall be taken to protect this TCP from effect. Users believe that construction activities will positively impact their ability to utilize this TCP and have no objection to this undertaking proceeding.

Nature and Extent Testing and Data Recovery/Treatment Plans shall be developed, reviewed by NNHPD and implemented, as appropriate. Such plans shall mitigate impacts to the following properties:

- AZ-I-6-38
- AZ-I-6-39
- AZ-I-12-23
- AZ-I-12-24
- AZ-I-12-27
- AZ-I-12-28
- AZ-I-12-29
- AZ-I-12-30
- AZ-I-12-32
- AZ-I-12-33
- AZ-I-13-01
- AZ-I-13-02
- AZ-I-13-03
- AZ-I-13-04
- AZ-I-13-05
- AZ-I-13-06
- AZ-I-13-07
- AZ-I-20-07
- AZ-I-20-08
- AZ-I-20-09
- AZ-I-20-10
- AZ-I-20-13
- N351-1

AZ-I-12-25 The site will be avoided by constricting north side of ROW to 75 feet. Permanent fencing will be installed between Sta. 716+00 and Sta. 720+00 along the 75 foot ROW left of centerline prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist. All ground disturbing activity within 50 feet of this site will be monitored by a qualified archaeologist.

AZ-I-12-26 The site will be avoided by constricting south side of ROW to 85 feet. Permanent fencing will be installed between Sta. 802+00 and Sta. 810+00 along the 85 foot ROW right of centerline prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist. All ground disturbing activity within 50 feet of this site will be monitored by a qualified archaeologist.

AZ-I-12-31 The site will be avoided by constricting east side of ROW to 150 feet. Permanent fencing will be installed between Sta. 990+00 and Sta. 996+00 along the 150 foot ROW right of centerline prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist. All ground disturbing activity within 50 feet of this site will be monitored by a qualified archaeologist.

AZ-I-12-34 The site will be avoided by constricting west side of ROW to 50 feet. Permanent fencing will be installed between Sta. 205+00 and Sta. 209+00 along the 50 foot ROW left of centerline prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist. All ground disturbing activity within 50 feet of

this site will be monitored by a qualified archaeologist.

AZ-I-20-11 The site will be avoided by realigning the ROW north. Constrict south side of ROW to 75 feet. Permanent fencing will be installed between Sta. 75+00 and Sta. 78+50 along the 75 foot ROW right of the realigned centerline (i.e., along the ditch on the south side of the existing road) prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist. All ground disturbing activity within 50 feet of this site will be monitored by a qualified archaeologist.

AZ-I-20-12 Component 3 will be avoided by realigning the ROW north. Constrict south side of ROW to 85 feet. Conduct nature and extent testing on that portion of Component 1 that remains within the realigned ROW; conduct additional data recovery as appropriate. Install permanent fencing between Sta. 78+50 and Sta. 81+50 along the 85 foot ROW right of the realigned centerline (i.e., along the ditch on the south side of the existing road) prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist. All ground disturbing activity within 50 feet of this site will be monitored by a qualified archaeologist.

I.U.A. 3 The project will have no effect on those characteristics that make the site eligible to the National Register of Historic Places.

I.U.A. 5 The project will have no effect on those characteristics that make the site eligible to the National Register of Historic Places.

The following stipulations will be followed pursuant to the Native American Graves Protection and Repatriation Act (NAGPRA):

G-1 See stipulations for AZ-I-20-12 above.

G-2 The site will be avoided by constricting ROW to 200 feet right of centerline. A qualified anthropologist shall monitor ground disturbing activities within 100 feet of this site.

G-3 The site will be avoided by constricting ROW to 200 feet right of centerline. A qualified anthropologist shall monitor ground disturbing activities within 100 feet of this site.

G-4 See stipulations for Site AZ-I-12-26 above.

G-5 The site will be avoided by constricting the north/northwest side of the ROW to provide a 50 feet buffer between the burial and the ROW. Install permanent fencing along the 75 foot ROW left of centerline prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist.

G-6 The site will be avoided by constricting the east side of the ROW to provide a 50 feet buffer between the burial and the ROW. Install permanent fencing along the 75 foot ROW prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist.

M-1 The site will be avoided by constricting ROW width to 100 feet (50 feet right and left of centerline). Install permanent fencing along the 50 foot ROW west of centerline prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist.

M-2 See stipulations for AZ-I-12-34 above.

M-3 The site will be avoided by constricting ROW width to 100 feet (50 feet right and left of centerline). Install permanent fencing along the 50 foot ROW west of centerline prior to initiating ground disturbing activities. Installation of fencing will be monitored by a qualified anthropologist.

FONSI/ CATEGORICAL EXCLUSION

UNITED STATES GOVERNMENT

memorandum

DATE: AUG 16 2001

REPLY TO ATTN OF: Leonard Robbins, Regional NEPA Coordinator

SUBJECT: FONSI for N35 Rock Point (at N12), to Sweetwater, to Red Mesa (at U.S. Highway 160) Environmental Assessment

TO: Navajo Regional Road Engineer

The Branch of Roads, Navajo Regional Office, Final Environmental Assessment, EA-95-016, entitled: *Navajo Route N35/N351/N5037/N5045, PROJECTS: N35(6), N35(7), N35(8), N35(9), N351(1), N5037(1), N5045(1), ROCK POINT TO RED MESA AND IMMANUEL MISSION ROAD, APACHE COUNTY, ARIZONA*, has been reviewed by the Branch of Environmental Services. A Finding of No Significant Impact (FONSI) has been determined for the proposed action. The proposed action will not have a significant impact on the quality of the natural and human environment. Therefore, an environmental impact statement for the N35 road reconstruction project is not required.

Should you require additional information, you may contact Mr. Leonard Robbins, Regional NEPA Coordinator, at (505) 863-8286.

Leonard Robbins

Enclosure: FONSI

cc: Navajo Regional Office Real Estate Services
Shiprock Agency Branch Roads / Real Estate Services

RECEIVED
AUG 16 2001
NAVAJO AREA ROADS

OPTIONAL FORM NO. 10
GSA
(REV. 1-94)
5010-118
NSN 7540-00-656-0924
FPI-SST

FINDING OF NO SIGNIFICANT IMPACT
ROAD CONSTRUCTION PROJECTS NAVAJO ROUTE N35(6), N35(7), N35(8), N35(9), N351(1), N5037(1), N5045(1), ROCK POINT TO RED MESA AND IMMANUEL MISSION ROAD, APACHE COUNTY, ARIZONA
BRANCH OF ROADS, NAVAJO REGIONAL OFFICE
BUREAU OF INDIAN AFFAIRS
ENVIRONMENTAL ASSESSMENT DOCUMENT EA-95-016

LOCATION: Rock Point, Dancing Rocks, Hogansaani Spring, Walker Butte, & Toh Atin Mesa, Arizona USGS Quadrangle Maps 7.5 Minute Series
Legal Description: Section 3, Township 38 North, Range 25 East–BOP,
UTM Coordinates: Zone 12, Northing 4065240, Easting 622370--BOP
Legal Description: Section 16, Township 41 North, Range 28 East–EOP
UTM Coordinates: Zone 12, Northing 4091480, Easting 646800–EOP

The proposed action addresses the N35 Road Construction Project, Rock Point at U. S. Highway 191, to Sweetwater, and to Red Mesa at U. S. Highway 160. The project, encompasses 33.3 miles. The project is sponsored by the Branch of Roads, Navajo Regional Office, Bureau of Indian Affairs of Gallup, New Mexico.

The project environmental assessment (EA) has been reviewed by the Navajo Regional Office, Branch of Environmental Services. Based on the information contained in the applicant's environmental document, including the mitigation measures as proposed in the document, it is determined the proposed road reconstruction project will not have a significant impact on the natural and human environment. Therefore, in accordance with the National Environmental Policy Act, Section 102 (2) (c), an environmental impact statement will not be prepared.

The following references serve as the basis for this decision and are incorporated in the project environmental assessment:

1. Agency and public involvement was solicited, and environmental issues related to the development of the road reconstruction project were identified. Alternative courses of action and mitigation measures were developed in response to environmental concerns and issues, EA @ Appendix A.

2. The EA disclosed the environmental consequences of the proposed action, and four potentially viable alternatives, including the "no action" alternative.

3. In compliance with the Endangered Species Act, a threatened and endangered species (T&E) list was acquired by the project sponsor from the Navajo Nation Natural Heritage Program (NNNHP), and the U. S. Fish & Wildlife Service. Field surveys were performed. A biological evaluation is crafted in sections 3.2, 4.1.4, and 5.0. The project is not expected to affect any federally listed species, notwithstanding, significantly impact any tribally listed species or other species of concern.

4. Potential impacts to flood plains and wetlands by the proposed alternative have been evaluated in accordance with Executive Orders 11988 and 11990 respectively. The described action will have no effect on wetlands, riparian areas, flood plains, or other sensitive areas.

5. In compliance with the Clean Water Act Section 401, the BIA Navajo Regional Office shall consult with EPA Region IX and acquire Section 401 Water Quality Certification prior to construction. The Branch of Roads shall comply with their construction protocol *Best Management Practices, Navajo Regional Roads*, EA @ 5.0.

6. In compliance with the Clean Water Act Section 402 (p), as amended, a Storm Water Pollution Prevention Plan (SWPPP) shall be crafted by the road project contractor (EA @ 4. 1. 2.). Project construction would comply with the general conditions of NPDES. A notice of intent would be filed with the US EPA by the Branch of Roads, and a Storm Water Pollution Plan (SWPP) for the project would be developed and kept on file at the construction site, and become part of the permanent record. The Branch of Roads shall comply with their construction protocol *Best Management Practices, Navajo Regional Roads*, EA @ 5.0.

7. In compliance with the Clean Water Act Section 404, as amended, Nationwide Permit (NWP) Number 14 for Linear Transportation Crossings was reviewed, and the project was determined to be eligible with respect to the NWP criteria, authorizing the activity for the proposed project (EA @ Part 3. 1. 5 & Appendix B-1). An Army Corps of Engineering 404 report was completed by the Albuquerque District on November 30, 1994. Branch of Roads shall comply with their construction protocol *Best Management Practices, Navajo Regional Roads*, EA @ 5.0.

8. In compliance with the National Historic Preservation Act of 1966, Section 106 and 36 CFR 800.9 (b) consultation, an archeological field inventory was performed for the project. A Cultural Resource Compliance Form, NNHPD No. HPS-94-002, was issued by the Navajo Historic Preservation Department as shown in Appendix D-1. N35, N351, & N5037 have been surveyed. N5045 shall be surveyed prior to construction. The proposed undertaking will have *no adverse effect* on the historic properties. The Branch of Roads shall insure adherence to the conditions of compliance as stated in the cultural resource compliance form.

   In the event of a discovery ["discovery" means any previously unidentified or incorrectly identified cultural resources including but not limited to archaeological deposits, human remains, or locations reportedly associated with Native American religious and traditional beliefs or practices (TCP)] all operations in the immediate vicinity of the discovery must cease and Navajo Nation Historic Preservation Department must be notified.

9. In accordance with the Resource Conservation and Recovery Act, Subtitle C, hazardous substances are mitigated in Sections 5.0 (1) to minimize the effects of the proposed action.

10. In accordance with the Resource Conservation and Recovery Act, Subtitle D, nonhazardous solid waste is mitigated in Section 5.0 (1) to minimize the effects of the proposed action.

11. The Navajo Nation Department of Agriculture was consulted by the project sponsor. The department has crafted a seed mixture, and method of reclamation for the proposed road project, EA @ Appendix C-3. Also see EA @ Sections 4.1.4 and 5.0 (11).

12. Cumulative and secondary effects on soil erosion, cultural resources, wildlife resources (species and habitat) were considered, and found acceptable, provided that the Branch of Roads shall implement mitigation measures as described in this environmental assessment, including the best management practices developed by the Branch of Roads for construction, EA @ Sections 4.1.8 and 5.0.

13. Impacts and mitigation to minority and low-income populations in accordance with the Presidents Executive Order on Environmental Justice has been considered by the Regional NEPA Coordinator, as well as the impacts and mitigation to Indian trust resources.

The proposed road project would improve the economic-social conditions, and serve the affected Rock Point, Sweetwater, Immanuel Mission, and Red Mesa Native American communities, and surrounding areas. The N35, N351, N5037, and N5045 road construction project is supported by resolutions from the Sweetwater, and Rock Point Chapters, and the Shiprock Agency Roads Committee.

Leonard Robbins

Navajo Regional NEPA Coordinator

August 15, 2001

Best Management Practices
Navajo Regional Division of Transportation

In order to avoid, reduce, or mitigate potentially adverse impacts during the construction of this project, the Navajo Regional Division of Transportation will incorporate the following best management practices into the project specifications (to the fullest extent possible):

1. Construct the project in accordance with the Manual for Standard Specifications for Construction of roads on Federal Highway Projects (FP-03), and in compliance with all applicable Navajo Tribal and Federal laws, codes, safety regulations, and executive orders.

2. The BIA Contractor avoid any increase in sedimentation of bodies of water on or near the project by preparing and implementing a Storm Water Pollution Prevention Plan (SWPPP). The Contractor will implement the SWPPP prior to any ground disturbing activities. Adjustments in the SWPPP, during construction, shall be coordinated with the BIA AOTR to insure compliance with the Clean Water Act.

3. The BIA Contractor shall stockpile the existing top soil for uses in re-vegetation of borrow pits and roadway slopes in accordance with the FP-03 and contract specification.

4. The cut and fill volumes will be balanced as much as possible to avoid the use of borrow sources and all slopes shall be rounded to blend into the existing terrain. All disturbed ground on the project will be disked, seeded, mulched, and re-vegetated as called for in the specification.

5. Construction hours will be between 6:00 am and 8:00 pm, Monday through Saturday, (weather permitting). See Special Contract Requirements for additional requirements. In high wildlife use areas, an alternate construction schedule may be used in consultation with the Navajo Fish & Wildlife Department and/or Us Fish & Wildlife Department.

6. The Contractor's camp and equipment storage area will be kept clean and free of litter at all times, to prevent debris and litter from entering bodies of water. All trash will be disposed of in accordance with EPA regulations and all camp sites and equipment storage areas will be restored to their natural condition at project completion (in accordance with Navajo Tribal permit requirements).

7. The Contractor will daily inspect all construction equipment for leaks and notify the BIA AOTR on the removal of leaking equipment from the project site until the leaking equipment is repaired and spills cleaned up to the satisfaction of the Project Manager and Environmental Quality Office.

8. All oils, fuels, lubricants, and hydraulic fluids, will be kept in sealed, storage containers and or facilities that meet EPA regulations for preventing contamination of the environment.

9. Damage to trees and shrubs outside of the construction limits will be replaced by the Contractor at his expense as directed by the AOTR.

10. Parking and staging areas will be limited to the construction limits. Utilization of existing roads for detours, storage of equipment, and the hauling of materials and water, will be used to the fullest extent possible. Storage areas within the construction limits will utilize existing disturbed areas and be kept as small as possible.

11. The installation of drainage structures will be undertaken in such fashion so as to minimize soil erosion and to provide for a minimum of 610mm of cover over the pipe as measured from the roadway shoulder.

12. Structural replacements will be performed during periods of low-or-no flow periods to minimize water quality impacts. No dumping of waste concrete will be allowed on the project site unless authorized by the AO and a detailed plan for storing waste on the project is submitted for review and approval. Such plan must include a properly designed, lined, and maintained containment pit located on high flat ground at least 15 meters from any drainage washes and other environmental/ archeological sites as shown on the design plans. Any and all waste, excess concrete, and asphalt materials stored in a containment pit will be disposed of (off site) in accordance to EPA regulations and the FP-03.

13. The Contractor will acquire Navajo water-use and aggregate material permits through the BIA and Navajo Tribal process, and follow all requirements of such permits, including royalties and environmental protection.

14. The Navajo Regional Division of Transportation and construction Contractor will acquire and comply with the following regulations regarding the Federal Clean Water Act as applicable:

a) Section 404 permit
b) Water Quality (Section 402) Certification
c)National Pollution Discharge Elimination System (NPDES) permit and the Storm Water Pollution Prevention Plan

15. Comply with all mitigation requirements concerning archaeological sites on or near the project site as defined in the compliance documents.

REVISIONS & SUPPLEMENTAL SPECIFICATIONS TO DIVISION 100 THRU 700 OF:

"STANDARD SPECIFICATIONS FOR AONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS"

(FP-2003)

SECTION 101 - TERMS, FORMAT, AND DEFINITIONS

101. 04 **Definitions:** Add and/or replace the following terms with their respective definitions:

Contracting Officer's Representative (AOTR).-- The AOTR is the duly authorized representative of the Contracting Officer (AO), and will act for the AO in administering the contract. The AOTR's duties and responsibilities are delineated by letter from the AO to the AOTR with a copy sent to the Contractor.

Engineer. -- Wherever the term "Engineer" is used in Division 100, the construction plans, or elsewhere in the specifications, it is changed to read "Awarding Official".

Sub-Contracting Officer's Representative (Sub-AOTR).-- The Sub-AOTR is the assistant field representative (Project Engineer/ Project Manager) of the AOTR whose duties and responsibilities are delineated by letter from the AO to the Sub-AOTR with a copy sent to the Contractor.

Awarding Official (AO). The AO is the duly authorized representative of the government who is authorized to enter into contracts and agreements and is responsible for awarding of P.L. 93-638 construction contracts and the administering thereof including determination of findings, issuing cure notices, contract terminations, and stop work order. Under P.L. 93-638 contracts, the term AO referred to in the FP-2003 means the AO.

Awarding Official's Technical Representative (AOTR).-- The AOTR is the duly authorized representative of the AO, and will act for the AO in administering the P.L. 93-638 contract through written delegation. The AOTR's duties and responsibilities are delineated by letter from the AO to the AOTR with a copy sent to the Contractor. Under P.L. 93-638 contracts, the term "AOTR" referred to in the FP-2003, Special Contract Requirements, supplemental specification, and construction plans means the Awarding Official's Technical Representative.

Major Floods. Major floods are define as wide spread flooding encompassing and inundating an area of 1300 hectares or more with water and debris within and adjacent to the project site.

Substantial Completion. Substantial Completion Will ONLY be given by the AO when the project is complete such that it can be safely and effectively used by the public without further delays, disruption, or other impediments as recommended by the AOTR during a substantial completion inspection. For conventional bridge and highway work, this is the point at which all road grading, bridge deck, parapet, pavement structure, shoulder, drainage, sidewalk, permanent signing and markings, traffic barrier, safety appurtenance, utility, and lighting work is complete and meets all the contract requirements.

Final Acceptance. Will be given when all work is completed (including any punch list of items) and the AOTR determines and schedules a final acceptance inspection with the Contractor, AO, and Regional DOT Representatives as appropriate. With the exception of any work accepted as final, in writing by the AO, the Contractor is still responsible for all the work until a final acceptance is given by the AO based on recommendations from the AOTR.

The definition for the word "Unsuitable" is superseded with the following:

Unsuitable or Deleterious Material - Material not capable of creating stable foundations, embankments, drainage structure installations, retaining wall construction, or roadbeds. Unsuitable material may include muck, sod, or soils with high organic and/or high PH (low resistivity) contents depending upon the materials proposed use on the project.

Staked Limits – Staked limits is the final subgrade catch points as reflected on the government furnished staking notes marked up by the contractor's surveyor to fit actual field conditions.

Construction Limits – Add the following to the definition: " The construction limits are the subgrade construction catch-point staked limits plus 3 meters not to exceed the right-of-way limits."

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Subsection 103.03 is superseded with the following:

103.03 Changes, Differing Site Conditions, and Variation in Estimated Quantities.

The following FAR Clauses are supplemented with the following:

Any adjustments in contract time and cost because of changes, differing site conditions, or variation in estimated quantities shall be in accordance with section 108.03 for the following:

Changes. - See Contract Clause 52.243-4.
Differing Site Conditions. - See Contract Clause 52.236-2
Variation in Estimated Quantities. - See Contract Clause 52.211-18

103.05 Partnering.

The third paragraph is superseded with the following:

If the partnering offer is accepted, mutually agree with the Government on the level of organizational involvement and the need for a professional to facilitate the partnering process. The Contractor shall engage a qualified facilitator and other resources for key Contractor and Government staff to attend a partnership development and team-building workshop at least 30 days prior to given "Notice to Proceed". Hold additional progress meetings upon mutual agreement.

To insure that all the work under this contract including any special contract requirements are adequately addressed and properly coordinated, attendance at the first partnering meeting shall include the Contractor's Construction Manager, Project Superintendent, Project Foremen, Sub-contractor representatives, and Supplier representatives, QCM, Alternate QCM and QC Inspectors/Technicians. The Government key personnel that may attend the first partnering meeting are AOTR- Project Manager, Agency monitoring crew, Regional staff engineers and/or technicians. The above key personnel shall attend any other subsequent meeting(s) deemed necessary by both parties.

The Government will invite utility owners, environmental and archeological staff to the first partnering meeting and/or any other subsequent meeting(s) deemed necessary.

Add the following new subsection:

103.06 Value Engineering. Follow the requirements of FAR Clause 52.248-3 Value Engineering Construction.

Before undertaking significant expenditures, provide the AO with a written description of the value engineering change proposal (VECP) concept. Within 14 days, the AO will inform the Contractor as to whether the concept appears to be viable or if the concept is unacceptable. If the AO indicates that the concept appears to be viable, prepare and submit the formal VECP proposal.

104.04 Coordination of Contract Documents:

The last sentence is superseded with the following:

The contract documents govern in the following order:

(a) 25 CFR Part 900, SubPart J
(b) 25 CFR Part 170, as amended
(b) Federal Acquisition Regulations
(c) Special Contract Requirements
(d) Supplemental Specifications
(e) Standard Specifications
(f) Plans

SECTION 106 - ACCEPTANCE OF WORK

106.01 Conformity with Contract Requirements.

Add the following:

All applicable sections in the latest edition (as referenced in the FP-03) with updates of the Federal Lands Highway, Field Materials Manual (FLHFM) shall apply to the work under this contract. If any requirements in the FLHFM conflict in either the FP-03, or these supplemental specifications, then the FP-03 and these supplemental specifications shall prevail.

106.04 Measured or Tested Conformance.

The second paragraph of this section is superseded with the following:

Results from Contractor inspection or testing shall have values within the specified tolerances or specification limits. Results from Government verification testing and inspection (as specified in the contract) shall be used to support or reject the work incorporated into the project as specified within the tolerances and/or specified limits within the contract. When no tolerance values are identified in the contract, the work shall be inspected, tested, and accepted based on customary manufacturing and construction standards.

106. 05 Statistical Evaluation of Work for Acceptance and Determination of Pay Factor (Value of Work).

The first sentence of paragraph (a) is superseded with the following:

(a) General. For work accepted based on statistical evaluation, both the Government and Contractor assume some risk. Unless otherwise specified in the contract, it is the responsibility of the AOTR and/or Navajo Region Division of Transportation (NRDOT) Manager to conduct the analysis described, and furnish the Contractor with the results which shall be used for determination of acceptance of the work and pay factors based under this section.

SECTION 107 - LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

107.02 Protection and Restoration of Property and Landscape.

Add the following to paragraph three:

Unless otherwise modified in writing by the AO, the construction clearing limits shall be (depending upon the type of project) the cut or fill limits shown on the plan and profile drawings, or staking notes provided plus **3** meters, or the new Typical Section width plus 3 meters for pavement rehabilitation projects. At bridges, culverts, furrow ditches, turnouts, existing road obliteration, fencing or other structures the limits shall be the minimum needed to construct the improvement as determined by the AOTR. In no case shall any work be done outside the right-of-way limits without prior approval from the Navajo Region Division of Transportation (NRDOT) Manager and AO.

Only remove vegetation that is necessary to construct the project and all its features. The Contractor shall use due care in his clearing and grubbing operations so as not to destroy vegetation that is not required for removal to the fullest extent possible.

107.06 Contractor's Responsibility for Work.

The third paragraph is superseded with the following:

The Government will only be responsible for losses, injuries, and damage cause by declared enemies and terrorists of the United States Government and cataclysmic natural phenomenon such as tornadoes, earthquakes, major floods, and other federally declared natural disasters by the United States Government. The Government will only be responsible for costs attributable to repairing or replacing damaged work. The Government will not be responsible for delay costs, impact costs, or extended overhead costs.

108.04 Failure to Complete Work on Time.

Add the following to Paragraph two:

The Contractor shall be subject to the Liquidated Damages Clauses as a result of the actions of their subcontractors in the amount specified in Table 108-1 for each day beyond the time allowed to complete the contract work, until final acceptance of the work is given. The Liquidated Damages shall be assessed when the entire project work cannot be completed due to delays as a result of any actions or inactions taken by the Contractor's sub-contractors.

108.05 Stop Order.

Paragraph two is superseded with the following:

No adjustment in contract time or amount will be made for stop work orders issued under **(a)** or **(b)**. An adjustment in contract time, as provided by FAR Clause 52.249-10 Default (Fixed-Price Construction) may be made when the Contractor is able to demonstrate that the weather was unusually severe based on the most recent 10 years of certified historical data provided by the Contractor.

SECTION 109 - MEASUREMENT AND PAYMENT

109. 01 Measurement of Work.

Add the following:

The metric unit of measure shall prevail in both measurement and payment of items as shown in the bid schedule. However this does not preclude the contractor from furnishing the English units equivalent for materials incorporated into the work from suppliers. The contractor shall be responsible for any misalignment and any other problems arising out of such conversions.

109.02 Measurement Terms and Definitions.

Subparagraph (a) is superseded with the following:

(a) Contract quantity. The quantity to be paid is the quantity shown in the bid schedule (designated as "CQ") and is the final quantity to be paid. The contract quantity will be adjusted for authorized changes that affect the quantity or for errors made in computing this quantity. If there is evidence that a quantity specified as a "*contract quantity*" is incorrect, submit calculations, drawings, or other evidence indicating why the quantity is in error and request, in writing, that the quantity be adjusted.

Add the following subjection:

(m) Contingent sum. Perform the work only when authorized by written change order. The work will be measured and paid for at agreed unit prices, lump sum prices, or force account as established in the order authorizing the work. When the unit bid price is designated "*contingent sum*", the quantity is designated as "All".

109. 03 Weighing Procedures and Devices.

Add the following:

All scales shall be re-certified annually or after each time they are moved, or as directed in writing by the AO. Provide current scale certification documents to the AOTR or Sub-AOTR.

The first sentence of subparagraph **(c)** is superseded with the following:

Furnish, erect, and maintain acceptable scales.

Paragraphs 6 and 7 of subparagraph **(c)** are superseded with the following:

For pay quantities based on weight, an automatic printer hooked up to the scales shall be provided that shall provide the following information for each weighing, or manually weigh and record masses with the same information below:

(1) Project Number
(2) Item number and description
(3) Date
(4) Time
(5) Ticket number

(6) Haul unit number
(7) Gross Weight (haul unit and mass); to the nearest 50 kilograms
(8) Tare Weight (haul unit); to the nearest 50 kilograms
(9) Net Weight (mass); to the nearest 50 kilograms
(10) Accumulated total net mass for all haul units since the beginning of the shift

The Contractor shall weigh the empty weight of vehicles with full fuel tanks hauling materials weighed on platform scales at the start of the day's operations, then at noon time. If the vehicle is replaced with another one during the operations, then the new vehicle shall be weighed empty with full fuel tanks and at the end of the day's operations.

Paragraph 8, in subparagraph **(c)** is superseded with the following:

Furnish competent scale operator(s) to operate the system when materials are Contractor-furnished from his own pit/source. Otherwise, the Contractor's commercial supplier shall furnish a competent scale operator(s) when materials are furnished from a commercial pit/source.

Add the following to paragraph 10 in subparagraph **(c)**:

The Contractor's QCM shall furnish the certified Accumulated Total Net Mass record to the AOTR the following workday.

109.04 Receiving Procedures.

The last paragraph is superseded with the following:

Use an approved format/form for the delivery record(s), which must be part of the Quality Control Plan. Furnish the original record(s) and a written certification of the delivery to the QCM with a copy to the AOTR or Sub-AOTR at the end of each shift. If any delivery report(s) does not contain the signature of the spread person or missing delivery report(s) cannot be found, or missing loads cannot be accounted for, the material shall not be paid for.

109.05 Scope of Payment.

Add the following to subparagraph (b):

This also includes work that is identified in the contract specifications as being incidental to other items of work or work called for in the specifications for which a bid items is not provided.

109.06 Price of Adjustments.

Paragraph **(b)(2) – Overhead** is superseded with the following:

(2) Overhead. The overhead rate(s) that apply to the prime Contractor under this contract cannot exceed 30% of the total direct labor costs. The rate the prime Contractor proposes shall be justified with supporting data to the AO. For all subcontract work, identify overhead rate(s) and provide supporting data, which justifies the rate(s) exceeding 5%. List the types of costs, which are included in overhead. Identify the cost pool(s) to which overhead is applied. Apply the overhead to the appropriate pool.

Limit Contractor overhead applied to subcontractor payments to 5 percent of such payments unless a higher percentage is justified.

Paragraph **(b) (3)-Profit** is superseded with the following:

(3) Profit. Except when precluded by the FAR, the profit shall not exceed 8% of the total costs reflecting the efficiency and economy of the Contractor and subcontractors in performing the work, the contract risk type, the work difficulty, and management effectiveness and diversity.
For work priced after all or most of the work is performed, profit is limited by statute to 10 percent of the total cost provided this rate can be justified.

Add the following paragraph to subparagraph **(b) Postwork pricing**:

(4) Bonding. The rate charged by any Contractor or subcontractor under this contract is 1% of the total cost of the work or any modification work unless a higher rate can be justified.

Paragraph 109.06(b)(1)c is superseded with the following:

(c) Equipment. Provide a complete descriptive listing of equipment including the make, model, and year of manufacture. Support rented or leased equipment costs with invoices. Determine allowable ownership and operating costs for contractor- and sub-contractor-owned equipment as follows:

(1) Use actual equipment cost data when such data can be acceptably determined from the Contractor's or sub-Contractor's ownership and operating cost records taking into account depreciation.

(2) When actual costs cannot be determined, use the rates shown in the *"Blue" or "Green Book"* (where applicable) published by Data Quest for the area where costs are incurred. Adjust the rates for used equipment and for other variable parameters used in the schedules.

(3) Compute proposed standby costs from acceptable ownership records or when actual costs cannot be determined, according to the Blue or Green Books. Do not exceed 8 hours in any 24-hour period or 40 hours in any calendar week. Do not include standby for periods when the equipment would have otherwise been in an idle status or for equipment that was not in operational condition.

Add subparagraph **(c)** as follows:

(c) Construction Price adjustments. The AO will consider price adjustments for material and other subcontractor price increases during the life of the contract based on a detailed price adjustment written request from the Contractor with supporting documentation.

109.08 Progress Payments.

Subparagraph (b) is superseded with the following:

(b) Closing date and invoice submittal date. On the first (1st) of each month or the following work day should the date fall on a weekend or holiday, the Contractor may elect (in accordance with the special contract requirements) to have the AOTR prepare and submit a pay estimate to

the Contractor for approval on a form acceptable to both the Contractor and Government. However, no payment can be submitted to the billing office without the AOTR agreeing with the work accepted in place and the quantities reviewed and approved by the AOTR for use in the progress payment preparation as outlined in subparagraph (c) below.

Subparagraph (c)

Add the following subparagraph (c)(9):

> **(9)** The pay estimate will be reviewed and approved (in writing) by both the Contractor's and government's field representative (AOTR) prior to submission to the NRDOT Office for approval and processing. Any errors found in the pay estimate by NRDOT staff shall result in the progress pay estimate being returned to the Contractor and/or AOTR for corrections and re-submission.

Subparagraph (c)(2) is superseded with the following:

> **(2)** A tabulation of total quantities, applicable calculations, and unit prices of work accomplished or completed, and accepted, on each pay item as of the closing date shall be provided to the AOTR or SubAOTR to validate (by closing date) the pay estimate request. Do not include any quantities unless field note documentation and calculations for those quantities was submitted by the closing date. Do not include quantities of work involving material for which test reports required under Sections 153 or 154 or certifications required by Subsection 106.03 are, or will be, past due as of the closing date unless otherwise agreed to by the AOTR.

Subparagraph (d) is superseded with the following:

(d) Government's receiving report. The Government's receiving report will be developed using the measurement notes received by the QCM and determined acceptable by the AOTR. Within 7 days after the closing date, the AO and/or AOTR will be available by appointment at the Government's designated office to advise the Contractor of quantities and unit prices appearing on the Government's receiving report.

Progress payments may include partial payment for material to be incorporated in the work, provided the material meets the requirements of the contract and that the Contractor includes in his request, a signed statement from the AOTR that the materials have been inspected and appear to meet the project specifications and match the quantities given in the pay estimate.

Add the following to subparagraph **(f) Partial payments**:

For stockpiled aggregates, the Contractor's request must include test results indicating compliance with the specifications to verify the request. The materials must be delivered on or in the vicinity of the project site and/or stored in acceptable (secured) storage places to be considered for partial payment.

109.09 Final Payment.

Add the following to paragraph two (2):

Final payment of the contract should be made no later than **120 days** from the date of **Final Acceptance** and verification of final pay records.

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SECTION 152 - CONSTRUCTION SURVEY AND STAKING

152.01 Description:

The following sentence supersedes the first sentence of the second paragraph:

Personnel, equipment, material, and survey notes shall conform to the following:

Subparagraph (a) is superseded with the following:

(a) Personnel. Furnish a technically qualified survey crew capable of performing the work in a timely and accurate manner. The survey crew shall be under the supervision of a Registered Land Surveyor (RLS) with a survey crew supervisor having at least 10 years of experience in highway construction survey and staking. The survey crew supervisor shall be on the project at all times during the survey and staking of each item of work and during the measurement of each pay item. The Contractor shall furnish résumé's on all members of the survey crew and the RLS to the NRDOT Division Manager, through the AOTR for review and approval prior to any survey work being performed.

Add subparagraph (d) to the second paragraph:

(d) Survey Notes. Furnish survey notes for the Survey and Staking Requirements:

(1) Roadway cross-sections. The Government shall furnish (upon written request) the final cross-sections taken of the roadway finished subgrade in electronic format agreed to by both the Contractor and government to use for the work under bid item **3030-6000 Roadway Reconditioning**. The Contractor shall stake the alignment to verify the alignment position before any reconditioning work begins and shall provide this data to the AOTR for review and approval.

(2) Slope stakes and references. Furnish slope staking and reference notes in hand written field books or electronic files in the same format provided to the Contractor by the government. Slope stake notes shall be provided in accordance with section 152.03(c) along with a finish subgrade and finish surface data file for use in any machine control work the Contractor may perform.

(3) Drainage structures. For any drainage work called for, the Contractor shall submit for approval graphical plots of the revised drainage structure lengths to fit the existing field conditions on maximum size 279 mm x 432 mm (11" x 17") sheets as well as in AutoCAD 2010 (*.DWG) or MicroStation V8i (*.DGN) file format.

(4) Other survey and staking requirements. Furnish other survey and staking notes in hand written field books in an agreed upon format with the AOTR and the QCM.

152.02 General:

Add the following paragraph after the first paragraph:

The Contractor is authorized to proceed with construction survey and staking prior to approval of the overall Quality Control Plan. The Contractor shall conduct all survey and staking per the Surveying QCP and these specifications. The work may be in the presences of a representative of the AO. The Contractor shall notify the AOTR at least one week before the actual surveying is to begin to allow the government time to have a representative on site.

The following sentence supersedes the first sentence of the fifth paragraph:

Before surveying or staking, discuss and coordinate the following with the AOTR:

The sixth paragraph is superseded with the following:

Survey and check government established controls within the tolerances shown in Table 152-1. The Contractor shall recheck all government furnished control point data prior to staking the alignment and other features. A report shall be provided to the AOTR on the control point checks in a format and method agreed to with the AOTR and NRDOT P&D Branch Surveyor. Once the control point data is verified and within the tolerances, the alignment can then be staked and the data furnished in (*.alg) Inroads format to the AOTR with all other required data. During Construction, any survey data that does not meet the tolerance requirements or is not in close conformance with the government furnished staking notes **MUST** be immediately reported to the AOTR for further direction to resolve the problem.

The following paragraph supersedes the seventh paragraph:

The Contractor shall prepare any required field notes in an agreed upon format with the AOTR and the Quality Control Manager (QCM) for the various bid items requiring survey measurements. The RLS shall review and certify the original copies of all survey notes at least weekly unless otherwise directed in writing by the AOTR. All original survey notes (certified by the RLS) shall be submitted through the QCM to the AOTR and become the property of the Government upon completion of project.

The Government will withhold payment in the event the Contractor fails to furnish survey notes and calculations that measure and demonstrate work performed. The Contractor’s submittal of their survey notes should have no errors outside the specified tolerances otherwise; the Government will send back the submittal for corrections to the work and/or survey notes at the entire expense of the Contractor.

152.03 Survey and Staking Requirements:

Add the following paragraphs to subparagraph (b) Roadway cross-sections:

For full subgrade construction slope staking, the Contractor shall field survey the **original** ground cross-sections, and/or existing pavement surface between centerline alignment and the proposed and/or existing right-of-way limits, to the maximum interval station and point spacing specified under 152.03(b) and Table 152-1. The Contractor

shall QC check the data and submit the **original** ground cross-section survey data, with the RLS certification to the AOTR for review and approval.

Perform the same procedure as outlined above for areas of the project where the **final** as-built subgrade cross-sections (subgrade blue-top) are completed (only if the government does not provide such data to the Contractor) up to the construction catch point limits (including all cut/fill slope sections) prior to placement of aggregate base course material. The data must exclude any waste or other stock piles within the right-of-way limits. The Contractor shall furnish the final as-built subgrade cross-section survey data with the RLS certification to the AOTR for review and acceptance. Do not begin any ABC or paving work until the survey data is reviewed and accepted by the government in writing through the AO/AO.

(c) Slope stakes and references. Add the following to subparagraph:

When earthwork is called for in the contract documents, submit the revised, government furnished, hard copy slope stake notes at completion of the slope staking operations to the AOTR & QCM for review and approval. The slope stake notes shall reflect the actual measurements in the field in red pencil or pen unless otherwise agreed to in writing between the Contractor and AOTR.

Any substantial deviations in the staking from what is shown on the government furnished staking notes must **immediately** be reported to the AOTR for corrective measures to be taken.

Add the following to Subsection (f):

Set the red top stakes for finish subgrade 5mm above the slope stake notes elevations provided. This will still allow for the finish subgrade to be within the $\pm$ 10mm tolerance shown on table 152-1. Set the blue top stakes for finish Aggregate Base Course (ABC) to the elevations provided in the slope stake notes for blue topping making sure the required uniform design thickness of ABC is achieved to insure the design template geometry is maintained (i.e. crown, hinge points, driving lanes, etc.).

Subparagraph (g) is superseded with the following:

(g) Drainage structures.

The Contractor shall stake drainage structures (when called for in the design plans) to fit existing field conditions. The location of the structures may differ from that shown on the design plans. Perform the following:

(a) Slope stake the entire project according to **Subsection 152.03(c)**. The AOTR and Contractor Quality Control Manager (QCM), shall review with the surveyor, the slope stakes at each drainage structure locations to verify the inlet and outlet locations, elevations, and skew of the proposed drainage structure (insuring that the drainage structures are not below the existing flow-line).

(b) After the AOTR and QCM agree with the location geometry, obtain the original ground profile along centerline of each structure including a distance of 20 meters upstream and downstream along the flow-line.

(c) Using engineering software (i.e. AutoCAD, MicroStation, etc.) plot the original ground cross-section and overlay the "as staked" roadway template with the appropriate skew on top of the original ground cross-section. Based upon these combined cross-sections, determine the structure invert elevations at the inlet and outlet. Plot the structure profile on the combined cross-section drawing. Calculate the total length of structure required and round up to the nearest 610 mm (2 ft) increment along the skew angle. When calculating pipe invert elevations and lengths, the lengths of any pipe end sections shall be subtracted from the total required pipe length per NRDOT guidelines furnished upon written request.

(d) Perform the same procedure as outlined in (3) above for drainage pipes under the turnouts and driveways.

(e) Plot the final structure profiles on to the existing ground/proposed roadway template cross-sections for all drainage structures. These profiles shall be on maximum size 279 mm x 432 mm (11" x 17") sheets to a scale provided by the AOTR. Assemble all pertinent structure information, into a spreadsheet acceptable to the AOTR, from the profiles, including station, length without end section(s), number of end sections, size of structure, number of structures per station, skew, invert elevations at inlet, roadway centerline, and outlet, roadway template distances and elevations, project number, contract number, current date, and name of person who prepared the document. Submit the complete revised structure list spreadsheet, including the final structure profiles, signed by the Prime Contractor, to the NRDOT Manager, through the AOTR for review and approval.

(6) After the revised structure list is approved by the AO and prior to installing the drainage structures, the Contractor shall stake the final structure location and give the AOTR three (3) business days to review the locations. Any structure location problems noted as a result of survey errors by the AOTR shall be corrected at no additional cost to the government.

Add the following subparagraph:

(m) For rehabilitation projects, the Contractor shall re-locate all existing right-of-way monuments (as reflected in the **existing** right-of-way map) and insure the "*English*" stationing is placed on the reference markers (i.e. angle irons) as defined in the bid schedule. For new road construction projects, and if bid items are shown in the bid schedule for installation of new right-of-way monuments and/or reference markers, stake the right-of-way monuments as shown in the design plans and label the reference markers with stationing in metric. Stamp or furnish the true state plane coordinates and elevations (to 3 significant figures) on the brass caps for all right-of-way monuments in metric regardless of the type of project unless directed otherwise by the AOTR.

152.04 Acceptance:

Add the following paragraph:

The Contractor's quality control inspection personnel shall make all the computations (with detailed and clear sketches as determined by the AOTR and/or SubAOTR) for any items of work requiring measurements based on the survey data provided (except for the final earthwork items as outlined in Subsection 204.16) or for periods for which progress payments are requested and record these calculations and sketches in bound inspection books. These calculations shall be reviewed and certified by the QCM and two copies forwarded to the AOTR for further review and processing.

152.05 Measurement:

Add the following paragraph:

All work outlined and required in this section, including surveying for roadway construction, bridge construction, slope staking, retaining walls, reference and clearing and grubbing staking, centerline re-establishment, blue topping, drainage structure survey and staking, grade finishing stakes (subgrade and aggregate base), right-of-way monument and marker location surveying and staking, quantity measurements, and miscellaneous surveying and staking shall be measured by the lump sum.

152.06 Payment:

This section is superseded with the following:

The accepted quantities, measured as provided in Section 152.05, Measurement, above, will be paid at the contract price per unit of measurement for the pay item listed below and as shown in the bid schedule beginning with the Notice to Proceed issued. Payment will be full compensation for the work prescribed in Section 152, Construction Survey and Staking.

When the bid schedule does not contain a bid item for Construction Survey and Staking, then it shall be considered incidental obligations to completion of the items of work described in the bid schedule.

Item 15201, as measured above, will be paid as follows:

(a) 40% of the lump sum will be paid following completion of the control point and alignment data verification, existing cross-section surveys, and slope staking work for finishing the subgrade and copies of these notes submitted to the AOTR (hard copy and electronic format) through the QCM for review and approval before payment is made.

(b) An additional 50% of the lump sum will be paid following complete staking of finished surface and all other structures and work requiring survey staking.

(c) The remaining 10% of the lump sum will be paid when the staking/ re-staking for corrective work and other surveying needed are completed and the Contractor submits all the original survey field books and data to the AOTR.

Payment will be made under:

Pay Item		Pay Unit
15201-0000	Construction Survey and Staking	Lump Sum

rev:07/18/12

Survey Quality Control Plan

The Construction Surveyor/ Party Chief ("Surveyor"), shall furnish technically qualified surveyors capable of performing the work in a timely, accurate and professional manner. The field crews shall be under the supervision of a Professional Land Surveyor with a minimum of 10 years experience in highway construction staking. Each member of the survey crew will have highway construction knowledge in performing GEOMETRIC computations. Crew members will assist and check the party chief in performing calculations and interpretations of the plans. Construction survey and staking will be performed within the tolerances specified in Table 152-1, and in accordance with section 152 of the FP-03 and the contract documents. All survey information will be forwarded to the BIA and critical attention be made to any potential changed to the construction plans.

Check shots on the horizontal and vertical control points will be taken, at a minimum, at the beginning and end of each instrument setup, or GPS session. This procedure will minimize errors due to installment "setting" and/or "drifting" satellite progression, or simple identifying the wrong point. Each instrument set-up will be verified by checking into two vertical benchmarks to ensure that the proper benchmark and elevation is being utilized and by measuring the distance to the "backsite" and one other control point to insure horizontal accuracy. All survey instruments will be well maintained and checked for proper adjustment on a regular basis.

The "Surveyor" shall develop a reporting form to ensure the Government and NECA that all of the survey data in conformance to the contract requirements. This form will be signed by the Field Supervisor and submitted along with the weekly reports and survey notes to the COR and the QCM on a weekly basis for review and approval.

At the beginning of each instrument set-up, or GPS session, "Surveyor" will spot check previously established positions for horizontal and vertical accuracy. This will provide and independent check on both the previously staked and the position and instrument session. Miscellaneous items such as cattle guards, turnouts, guardrail, paved waterways' etc. will be checked by station/offset.

Independent checks by BIA agency supervisors will check the accuracy and reinforce this Quality Control Plan. "Surveyor" will schedule locations for BIA perform the independent checks. Any variation, between the "Surveyor" and BIA surveys should be brought to the attention of our field supervisor or party chief. Any discrepancies shall first be discussed among "Surveyor" and BIA. Discrepancies should be resolved in the field if all possible.

This Quality Control Plan has been written to correspond with Section 152 of the specifications. Various sections of the specifications are discussed with specifics related to this project.

Section 152.02 Requirements:

Before any work begins, the Surveyor shall discuss and coordinate with the COR :

1. Surveying & Staking methods to be used;
2. Stake markings and their meaning;
3. Grade control for each course of material;
4. Referencing and project control points (bench marks);
5. Structure control; and
6. Any other procedures, calibrations, and controls necessary for the work to be carried out

Prior to the beginning of construction, the centerline alignment, horizontal and vertical control and design grade initially provided by the Government will be field checked and confirmed prior to beginning any other survey work with a verification report provided to the COR and the BIA Regional Surveyor. "SURVEYOR" will notify NECA and the Government immediately if the said references do not meet the required tolerances in Table 152-1. No further staking will be performed until the Government has approved the verification report.

The "SURVEYOR" will collect all existing ground and (if required) existing ground on borrow pits and field check all data using GPS and/or conventional field equipment and process the survey data with surveying software into files that can be encoded in the AutoCad 2009 platform and InRoads v8i format per section 152.01(d). All duplicate points and lines shall be cleaned up prior to generating a digital terrain model of the existing and final subgrade/ground. The "Surveyor" will perform conventional optical differential level loops on all vertical benchmarks (i.e. control point data) furnished by the Government to verify that the reported elevations fall within the tolerances. The "SURVEYOR" will hold all control point elevations furnished by the Government, provided it meets the tolerances of plus or minus ten millimeters (10mm).

GPS equipment will be used for horizontal verification and staking out of the sub grade. This work will include an independent network check using Government provided control points and one National Geodetic Survey (NGS) control monuments. Once the network is complete, a minimum of a six point horizontal: vertical calibration will be developed not exceeding 4 kilometers for localizing from grid to ground. All Calibrations will be recorded electronically and a hard copy will be provided to the Government.

All vertical BMs will be verified by performing optical differential levels. A tolerance of plus or minus 10 mm will be allowed. In the course of running differential levels, a daily collimation test (peg test) will be run to avoid errors.

When using conventional and total station equipment, the "Surveyor" will perform weekly collimation tests which shall consist of a Compensator test, HA/HV test, and Trunnion Axis Tilt test using the manufactures specification.

Any inconsistency with the Government's alignment, control and or grade shall be brought to the attention of NECA and the Government (COR) prior to continuing any surveys or construction.

Bi-monthly meetings (during construction) shall be scheduled with NECA and the COR to discuss all surveying activities and changes in activities as listed in Section 152.02(a) through (f), and the Tolerances listed in Table 152- 1. All field notes shall be scanned to PDF format and also submitted in hard copy. All field notes shall be marked in red for changes made in the field for adjustment to fit actual field ground conditions.

The project will be divided into multiple sections and field staked according to the Government furnished slope staking notes. all subgrade staking (red top) shall be staked in accordance with Section 152-03 (f) in accordance with Table 152-1. All finish grades (blue top) shall be staked by conventional total station and/or optical level surveying equipment accordance with Table 152-1. A Governmental field check shall be scheduled for the slope staking and to resolve any non-tolerance issues. In the event that issues are not resolved, no field survey will continue until arrangements have been made with the Government.

Section 152-03 Surveying and Staking Requirements:

(a) Control Points:

Horizontal and vertical BIA control points will be located upon the start of the project. The points will be verified to within acceptable limits per table 152-1 and a detailed summary submitted for review. This also includes temporary benchmarks established along the project area.

The “Surveyor” shall perform all horizontal and vertical construction and control surveys in a professional manner utilizing “self-checking” procedures (i.e. use of conventional total station or GPS setting up on one known control point and fore sighting or back sighting another known control point). Horizontal control and layout surveys will utilize a minimum of two control points. A GPS calibration will be developed initially using Government supplied horizontal and vertical control points utilizing a minimum of six (6) horizontal and six (6) vertical control points. Prior to establishing this calibration, vertical and horizontal control points will be checked and referenced off of the project site. Once an acceptable GPS calibration is developed, it will be used exclusively for the remainder of the project.

Any update to control datum will comply with Table 152-1.

SAMPLE OF RTK FIELD CO/AONTROL CHECK: THIS EXHIBIT SHOWS THE RESULTS OF A FIELD CHECK OF OUR LOCALIZATION CO/AOMPUTATIONS.

PT	BIA North(m)	BIA East(m)	BIA Elev(m)	PT	RTK North(m)	RTK East(m)	RTK Elev(m)	North Diff	East Diff	Height Diff	CO/AODE
23	562986.4	238585.3	1844.246	70	562986.4	238585.3	1844.257	0	0	-0.011	SCP301
10	562884	238631	1844.967	68	562884	238631	1844.974	0.026	0	-0.007	SCP3000
10	562884	238631	1844.967	480	562884	238631	1844.985	0.025	0.003	-0.018	CK_68
22	562881.5	238716.5	1843.5	60	562881.5	238716.5	1843.432	0.022	0.007	0.068	SCP300
11	562836.1	238659.2	1844.517	66	562836.1	238659.2	1844.513	0.019	0.005	0.004	SCP1
12	562827.4	238556.1	1846.781	72	562827.4	238556.1	1846.778	0.006	0.005	0.003	SCP2
13	562740.2	238538.4	1846.486	74	562740.2	238538.3	1846.492	-0.008	0.018	-0.006	SCP2A
14	562725.2	238482	1847.754	76	562725.2	238482	1847.757	0.011	0.018	-0.003	SCP3
15	562674.9	238497.8	1847.671	78	562674.8	238497.8	1847.672	0.012	0.009	-0.001	SCP4
20	562619.3	238477.4	1849.218	84	562619.3	238477.4	1849.218	0	0	0	SCP5
20	562619.3	238477.4	1849.218	148	562619.3	238477.4	1849.23	0.01	0.007	-0.012	CK_84

SAMPLE OF RTK FIELD CENTERLINE CO/AONTROL CHECK: THIS EXHIBIT SHOWS THE RESULTS OF A FIELD CHECK OF OUR LOCALIZATION CO/AOMPUTATIONS.

Point	Ground North(m)	Ground East(m)	Action	Point	BIA North(m)	BIA East(m)	North Diff	East Diff	Center Sta
161	562896.1	238652.6	SET	1	562896.1	238652.6	-0.005	-0.01	POB 0+000.000
159	562880.7	238639.9	SET	2	562880.7	238639.9	-0.004	-0.002	BOP 0+019.980
157	562828.5	238597.2	SET	3	562828.5	238597.2	0.002	-0.007	PC 0+087.400
155	562767.5	238551.6	SET	5	562767.5	238551.6	0.003	-0.007	PT 0+163.590
154	562634.8	238461	SET	6	562634.8	238461	-0.004	0.007	PC 0+324.290
152	562611.8	238462.5	SET	8	562611.8	238462.5	-0.005	0.001	PT 0+3493.090
150	562591.1	238480.9	SET	9	562591.1	238480.9	-0.007	-0.001	POE 0+376.770

SAMPLE OF DIFFERENTIAL LEVEL LOOP CO/AONTROL CHECK:

RTK PT#	RTK Elevation (m)	BIA PT#	BIA Elevation (m)	RTK Height Difference	RTK PT#	SL Elevation (m)	SL Height Difference	RTK VS SL Height Difference
84	1849.218	SCP5	1849.218	0	20	1849.218	0	0
82	1849.497	SCP200	1849.483	0.014	19	1849.484	-0.001	0.013
80	1849.617	SCP6	1849.626	-0.009	18	1849.625	0.001	-0.008
90	1849.742	BASE			90	1849.746		-0.004
78	1847.672	SCP4	1847.671	0.001	15	1847.663	0.008	0.009
76	1847.757	SCP3	1847.754	0.003	14	1847.744	0.01	0.013
74	1846.492	SCP2A	1846.486	0.006	13	1846.476	0.01	0.016
72	1846.778	SCP2	1846.781	-0.003	12	1846.768	0.013	0.01
68	1844.974	SCP3000	1844.967	0.007	10	1844.965	0.002	0.009
66	1844.513	SCP1	1844.517	-0.004	11	1844.498	0.019	0.015
60	1843.432	SCP300	1843.5	-0.068	22	1843.481	0.019	-0.049
70	1844.257	SCP301	1844.246	0.011	23	1844.23	0.016	0.027

(b) Roadway Cross-Sections:

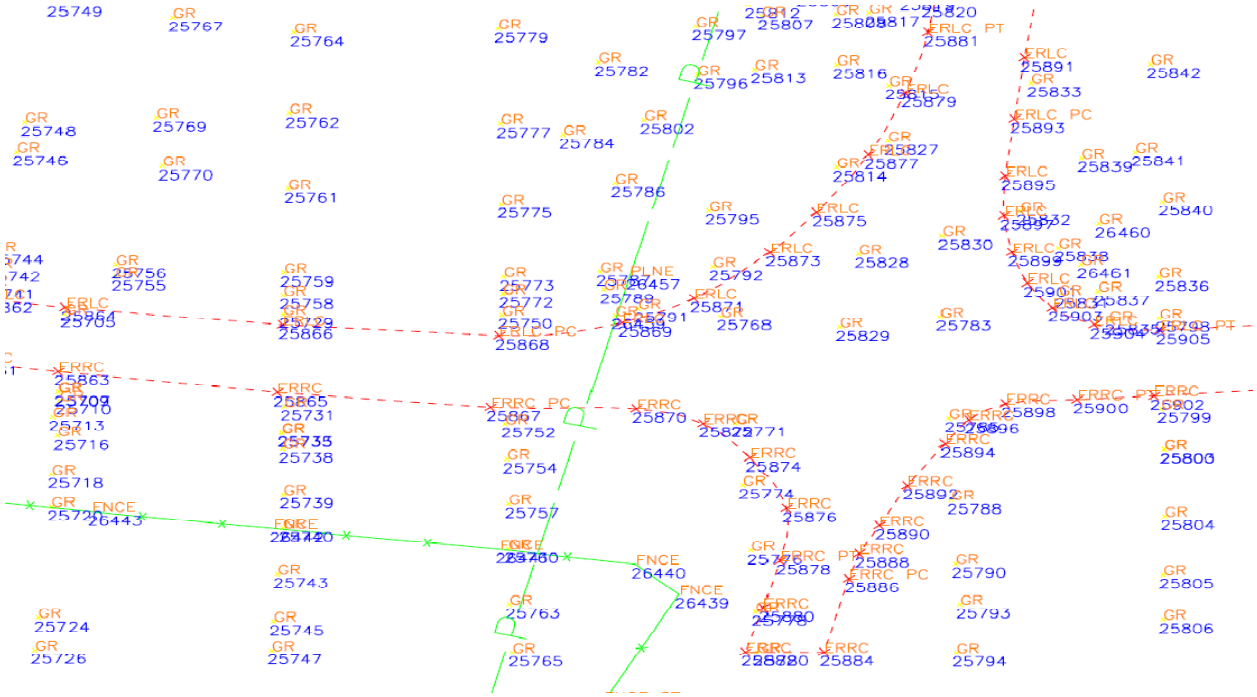
Roadway cross sections will be taken at a maximum spacing of 20 meters along tangent of roadway and every 10 meters along curve of roadway sections. Each cross section shall be located based on known control points with all breaks or changes noted.

All topographic terrain breaks will be classified as break lines and all topographic flat surfaces will be classified as ground points. All break lines will be measured and recorded in a continuous pattern. The data points will be numbered in a sequential order and all break lines will be coded to best describe feature and stringed separately (i.e. TW, BB, DL, FL, etc.). Any topographic breaks within 5 meters of the 20 meter station increment will be measured and recorded. The project will be treated as single DTM with regards to data processing. All cross section data shall be formatted in an ASCII delimited point file (Point Number, Northing, Easting, Elevation and Code) and submitted to the Government along with an electronic copy of the survey raw data file. A complete description of the feature codes used for the breaklines and other point data will be provided to the Government in a Microsoft Word or Excel file that encompasses the entire feature code library. All survey data will be converted into a DTM using Bentley InRoads Survey V8i or equivalent. A planimetric drawing for plan and profile and cross sections in 20m increments shall be prepared using AutoCad v.2009 or equivalent to check the data (i.e. breaklines and other point features) before submission. The drawing will be used to correct any common geometry errors resulting from duplicate line features and survey data points in the data files.

SAMPLE OF SURVEY CROSS SECTION DATA IN ASCII FORMAT

5009,562748.586,226201.669,1907.62,TOEL ST
5016,562761.356,226177.938,1907.86,TOEL
5019,562766.636,226156.843,1907.74,TOEL
5025,562773.642,226134.921,1907.98,TOEL
5047,562793.013,226045.727,1907.98,TOEL ST
5048,562788.462,226063.213,1907.87,TOEL
5049,562786.385,226076.845,1907.61,TOEL
5050,562784.637,226083.787,1907.39,TOEL
5051,562779.541,226099.846,1907.32,TOEL
5052,562768.373,226102.379,1907.31,TOEL
5053,562765.775,226104.285,1906.96,TOEL
5054,562761.967,226114.021,1906.78,TOEL
5055,562770.319,226105.855,1906.68,TOEL ST
5056,562773.88,226108.926,1906.38,TOEL
5064,562781.127,226106.864,1907.7,TOEL ST
5065,562785.257,226090.849,1907.68,TOEL
5068,562789.308,226075.723,1907.85,TOEL
5069,562792.694,226060.411,1907.96,TOEL
5072,562795.618,226046.363,1908.1,TOEL
5116,562796.318,226045.005,1908.17,TOEL ST
5118,562799.192,226025.045,1908.35,TOEL
5127,562801.807,226007.887,1908.62,TOEL
5130,562803.345,225989.244,1908.84,TOEL
5137,562806.272,225961.669,1909.49,TOEL
5140,562805.696,225940.881,1909.71,TOEL
5145,562805.533,225921.438,1909.84,TOEL

SAMPLE OF SURVEY CROSS SECTION DATA PROCESSED IN TGO. INROADS, OR OTHER EQUIVALENT SOFTWARE:



(c) Slope Stakes and References:

The "Surveyor" shall field stake the project according to the Government's slope stake notes. In the event that field stakes require field adjustments due to terrain changes, the "SURVEYOR" will make the necessary field adjustments and redline all changes in their slope stake field book and on the Government furnished staking notes. If field adjustments become too extreme (i.e. catch points exceeding 305 mm from the reported slope stake notes, elevations exceeding 152mm, or slopes exceed the typical section slope for a given height criteria), the "Surveyor" will notify NECA and the Government (AOTR) immediately prior to continuing any more field surveying.

The "Surveyor" will reset all slope staking that may have been removed or is in conflict with construction activities.

All subgrade staking will be staked per 152-03(f) below meeting the tolerances of Table 152-1.

Sample Government Marked up Staking Notes:

Station:	38+120.000							14.13	
Feature		LFill 1	LSP	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1 10.20	
Elevation	F 0.625	1909.783	1910.408	1910.853	1911.435	1911.900	1911.455	~~1910.034~~	F 1.421
Offset	@ 2.499	13.251	10.752	8.082	0.000	6.465	9.135	14.819	@ 5.684
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%
Station:	38+140.000								
Feature		LFill 1	LSP	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1	
Elevation	F 0.705	1909.934	1910.639	1911.084	1911.666	1912.131	1911.686	1910.839	F 0.846
Offset	@ 2.818	13.570	10.752	8.082	0.000	6.465	9.135	12.521	@ 3.386
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%
Station:	38+160.000							13.69	
Feature		LFill 1 10.27	LSP 13.15	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1 10.78	
Elevation	F 0.734	19~~10.135~~	1910.869	1911.314	1911.896	1912.361	1911.916	19~~10.654~~	F 1.263
Offset	@ 2.935	13.687	10.752	8.082	0.000	6.465	9.135	14.186	@ 5.051
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%
Station:	38+180.000							14.13	
Feature		LFill 1 10.29	LSP 13.99	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1 10.89	
Elevation	F 0.912	19~~10.180~~	1911.097	1911.542	1912.124	1912.590	1912.145	~~1910.769~~	F 1.375
Offset	@ 3.647	14.400	10.752	8.082	0.000	6.465	9.135	14.636	@ 5.501
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%
Station:	38+200.000								
Feature		LFill 1	LSP	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1	
Elevation	F 0.968	1910.305	1911.274	1911.719	1912.300	1912.766	1912.321	1910.950	F 1.371
Offset	@ 3.873	14.625	10.752	8.082	0.000	6.465	9.135	14.619	@ 5.484
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%
Station:	38+220.000	10.60	13.87					14.45	
Feature		LFill 1	LSP	L_Subgr	Subgr_CL	R_Subgr	RSP	RFill1 11.09	
Elevation	F 0.921	19~~10.456~~	1911.377	1911.822	1912.404	1912.870	1912.425	~~1910.983~~	F 1.442
Offset	@ 3.684	14.437	10.752	8.082	0.000	6.465	9.135	14.902	@ 5.767
Slope	-25.00%	-25.00%	-16.67%	-7.20%		7.20%	-16.67%	-25.00%	-25.00%

(d) Clearing and Grubbing Limits:

When clearing and grubbing is required, clearing and grubbing limits will be staked in conjunction with determining the existing right-of-way lines along the project. The clearing/grubbing limits (catch point location plus one meter) will be staked in accordance Section 201 of the FP 03. The right-of-way will be staked with flagging (lath) on (1m) wooden stake during the cross section survey based on the data provided by the government from the right-of-way plats. All clearing and grubbing will be staked based on established control and calibration procedures.

Any potential project encroachment outside the right-of-way for culverts, cut or fill slopes shall be brought to the attention of the BIA if not already noted in the design plans. No construction outside of the right-of-way will occur without specific authorization from the BIA.

(e) Centerline Reestablishment:

Upon the Government acceptance of the "Surveyor" centerline alignment verification, the "Surveyor" will field stake the centerline using wooden stakes and lath to properly identify the alignment. Stakes will be set every 10 meter interval along the horizontal alignment curvatures and every 20 meter interval along the horizontal alignment tangents.

(f) Grade Finishing Stakes:

The "SURVEYOR" will field stake all finish grades in accordance with the grades provided by the Government (i.e. P&P sheets and slope staking notes). Except for use of GPS machine control grading on final subgrade, all finish grades will be staked by conventional total station and/or optical level surveying equipment in accordance with Table 152-1. The "Surveyor" will use standard wood pegs and brushes to mark the subgrade and the top of aggregate. Stakes will be set at10 meter intervals along the curved alignments and at 20 meter intervals along the horizontal alignment tangents.

For machine control grading, the Contractor, AOTR, and regional P&D staff will meet to come up with a grading plan that will meet the tolerances, super elevations, and profile required for the finish subgrade and surfacing and still maintain the proper surfacing thickness and crown.

(g) Culverts:

When culvert staking is required, the "Surveyor" will stake all culvert locations in accordance to the grades provided by the Government's slope staking notes following the BIA NRDOT Planning & Design Branch guidelines. Due to terrain changes caused by seasonal runoff, the culvert size and location may change. Prior to any pipe staking, the "SURVEYOR" will conduct the following:

1) Reference the topographic cross section survey and reestablish a ground profile from the culvert centerline extending 20 meters beyond the preliminary design inlet and outlet.

2) Field stake the catch points at the 20 meter station interval before and after the pipe location and at each inlet and outlet culvert pipe.

3) Set reference points to determine pipe skew and depth.

4) Create a standard profile and cross section along the culvert centerline in 6 or 8 equal distances (5 to 10 meters apart) beginning 20 meters from the inlet and ending 20 meters from the outlet of the culvert location. The "SURVEYOR" will label the culvert size, length, grade, elevations and degree of skew.

5) Create a detailed drawing to scale in AutoCad illustrating the profile and cross sections for each culvert pipe location on 11" X 17" format conforming to section 152.03(g) of the FP-03 and submit to the Government for approval.
6) Upon the Government's acceptance, the "SURVEYOR" will provide all surveying stakes referencing the drainage, controls, and culvert inlet and outlet locations for the Contractor.

(g) Bridges: (When Required)

The "Surveyor" will set a minimum of four No. 5 rebars for horizontal and vertical control to construct the bridge structure and superstructure components to the tolerances in table 152-1. Bridge staking will be performed with a 3 to 5 second total station and differential levels, to ensure the tight tolerances that bridges (prefab iron and concrete structures, ie., pier, bent and abutment) require. Set the centerline for all peirs, bents, and abutments. All piers, bents and abutment corners will be cross checked with a steel tape adjusted for temperature correction for horizontal accuracy. All elevations associated with the bridge will be determined by differential elevations to ensure the vertical accuracy and tolerance. Pier cap cutoff elevations will be performed with a differential level. The outside face of concrete on the abutments will be staked on offsets with cuts and fills to the top and bottom of the structures. The pier wall at the center of the bridge will be staked on offsets with cuts and fills to the top and bottom of the structure.

The toe of the riprap will be staked and "as-built" with a total station to determine both horizontal and vertical location before backfilling begins. The bridge beams will be staked with offsets to each end of the beams for proper alignment, once the bearing pads and beams are in place the diaphragm locations will be marked on the top of the beams.

The "as-builts" (other than those done during road construction) will be updated to reflect the "as-built" geometric location of the bridge.

(h) Retaining Walls: (When Required)

The "SURVEYOR" will set a No. 5 rebar for all horizontal and vertical control datums to construct the retaining wall. Survey and record profile measurements along the face of the proposed wall, 2 meters in front of the wall face, and 5 meters along the length of the wall. The "SURVEYOR" shall survey and record cross sections 5 meters apart at every major terrain break.

(i) Borrow and Waste Sites (When Required):

All horizontal and vertical control points will be established prior to any excavations or spoil displacements. The General Contractor **must** clear and grub the borrow limits prior to measuring and recording all topographical cross section data.

The “SURVEYOR” will set at least two (2) No. 5 rebar for all horizontal and vertical control datums to survey and record the initial baseline, site limits, clearing limits and cross section grid points. The “SURVEYOR” shall survey and record initial and final grid cross sections for the project and follow the same procedure as Section 152.03 for verifying the data before submission to the Government.

(j) Permanent Monuments and Markers:

The “SURVEYOR” will set 4 initial swing-tie reference points for each location of all permanent monuments. The “SURVEYOR” will stake out and mark each monument at the centerline point using GPS and/or conventional survey equipment using the coordinates provided by the Government. The “SURVEYOR” will measure and record (in bound survey books) each centerline point. All measurements will be in accordance with Section 152, Table 152-1. The data will then be provided to the Government for future reference.

(l) Miscellaneous Survey Staking:

The “SURVEYOR” will perform all surveying, staking, and recording of data for establishing the layout and control of the following (but not limited to);

1) Approach roads and trails;
2) Curb and gutter;
3) Waterways;
4) Parking areas;
5) Special ditches;
6) Turf or seeding and mulching limits;
7) Signs, delineators and object markers;
8) Pavement markers.
9) Utilities
10) Ditches
11) Guard rails

The “Surveyor” will consult with the COR and the BIA regional office on issues arising that require assistance beyond the Surveyor’s control.

SECTION 153- CONTRACTOR QUALITY CONTROL

153.01 Description.

This paragraph is superseded with the following:

This work consists of the Contractor furnishing an AASHTO certified laboratory to obtain samples for quality control testing, perform tests for Contractor quality control, provide construction inspections, enforce contract specifications, ensure construction plans are followed and exercise management control to ensure that all items of work conform to the contract requirements. This Section supplements FAR Clause 52.246-12, Inspection of Construction.

153.02 Contractor Quality Control Plan.

The first paragraph is superseded with the following:

Twenty-one (21) calendar days prior to construction work, the Contractor shall submit a written Quality Control Plan (QCP), which includes all subcontractors, and suppliers/fabricators of major construction components, and subcontracted surveying services for review and approval. The Contractor shall not be allowed to begin construction on major items of work until the Navajo Region Division of Transportation (NRDOT) Manager has approved all QCP's. With prior approval, submission of a quality control plan for major items of work not immediately scheduled to begin may be deferred. Subsequent submission of deferred QCP major items shall require 14 days for review and approval.

The only construction work that is authorized to proceed prior to the approval of the QCP is mobilization of storage and office trailers, temporary utilities, and any other work that does not require sampling, testing, and/or inspection.

(a) Process control testing.

This subparagraph is superseded with the following:

A Testing Plan and Log (examples shall be provided upon request) that includes the tests required, referenced by the FP specification section number and paragraph number requiring the test, the frequency, and the person responsible for each test.

Provide the name(s) of the person(s) in the QC organization authorized to review and certify submittals prior to approval by the AO.

(b) Inspection/control procedures.

The first sentence is superseded with the following:

Provide a comprehensive and detailed inspection plan for <u>each bid item of work</u> showing each construction requirement criteria by phase, with cross-references to the contract drawings and specifications, and the results from the action taken by the Quality Control Manager. A sample of an acceptable format for providing the information required shall be provided upon request. While use of this specific format is not required, any other format used shall contain the same information. Address each of the following subjects in each phase of construction for each item of work:

(3) Production phase. Add the following subparagraph (d):

(d) Inspect materials and/or assemblies accepted under subsection 106.03 Certification to ensure that the materials comply with all contract requirements. Furnish the results of the inspection, along with the production certifications or commercial certifications (as applicable) to the NRDOT Manager and AOTR prior to incorporating the materials into the work. This requirement includes fabrication of bridge girders, concrete or steel cattleguards, steel corrugated pipes, steel guardrail sections, etc.

(d) Personnel qualifications.

Subparagraph **(1)** and **(2)** of this subsection are superseded with the following:

(1) Quality Control Manager. Designate a qualified Quality Control Manager (QCM). **A QCM shall be at the project site at all times to manage and carry out the Quality Control Plan (QCP)**. The QCM shall be a full time employee of the Contractor's independent accredited testing laboratory who will work with and take direction from the AOTR. The duties and responsibility the QCM shall have on this contract is managing, monitoring, implementing and as necessary, adjusting the processes to assure quality of the QCP. The QCM may perform inspection and testing on a periodic basis, verifying quantities for progress payments, and issuing of written non-conformance orders to the Contractor. The QCM is required to attend and participate in the preconstruction meetings, partnering meetings, conduct the QC meetings for the work at least once weekly, perform the three phases of control, perform submittal review, ensure testing and inspections are performed, ensure construction plans are followed, review construction plans for errors or conflicts that may arise with testing and inspection procedures, and prepare QC certifications and documentation required in this contract. The QCM shall report (through a written non-compliance order) any deficiencies in the work directly to an officer of the Contractor's firm and the government AOTR or Sub-AOTR. Furthermore, it is the QCMs responsibility to enforce all "non-compliance orders" issued by the AOTR to the contractor and/or QCM. The QCM shall also stop work for the purpose of unsafe conditions. **The QCM shall not be the same individual as, nor be subordinate to, the project superintendent or the Contractor's project manager.**

The QCM shall be a graduate of a two to four year accredited engineering technology program in an Engineering discipline with a minimum of five (5) years experience as a highway construction superintendent, inspector, project manager, or construction manager and one year experience as a QCM on similar size and type construction contracts which included the major trades that are part of this contract as reflected in the person's resume to be included in the QCP. Or a civil engineering technician with at least 8 years of progressive experience in highway/bridge construction which includes basic surveying knowledge (i.e. read slope-stakes, use of a hand level, etc.), basic sampling and testing of materials, project record keeping, interpretation of plans and specifications, performed inspections on various components in highway/bridge construction, basic knowledge of traffic safety and the MUTCD, first aid, performed final measurement(s) of contract items, prepared as-built plans, knowledge of OSHA and other safety requirements and be currently certified by the National Institute for Certification in Engineering Technologies (NICET), Level III or higher in the subfield of Highway Materials or Highway Construction or an equivalent certification program as reflected in the person's resume to be included in the QCP.

Designate a "stand-in QCM" to act on behalf and serve only in the absence of the QCM at the project site for **no more** than two (2) working days due to unforeseen circumstances. The

qualifications for the "stand-in QCM" must meet the requirements for an inspector and must be an approved inspector assigned to the project.

Designate an Alternate QCM for the project. The qualification requirements for the Alternate QCM shall be the same as for the QCM. The Designated Alternate QCM shall only act on behalf and perform the duties of the QCM during his/her absence from the project site for a period not to exceed two weeks due to unforeseen circumstances. If the original QCM cannot return to the project site after one week; a new "stand-in" QCM shall immediately be submitted for approval to take over the QCM responsibilities.

By being designated the "stand-in" QCM or Designated Alternate QCM does not mean the person can freely come onto the project site and conduct any testing and/or inspection. They must properly submit a completed **"Submittal, Transmittal, Review and Approval Form"** and current certifications to the NRDOT Manager for review and approval if they are to perform and conduct any testing and/or inspection work. Such testing and inspection work must be in the field for which the person is certified ONLY.

As a part of the QCP, provide a letter signed by an officer of the Contractor's firm appointing the QCM, "stand-in QCM", and Alternate QCM stating that he/she is responsible for managing and implementing the QC plan as described in this contract. Include in this letter the QCM, "stand-in QCM", and Alternate QCM authority to reject and direct the removal and replacement of non-conforming work and materials and to stop work for the purpose of unsafe conditions.

(2) The Contractor shall provide for approval the names, authorities, resume(s), and relevant experience of all personnel directly responsible for the testing and inspection. **The Contractor shall work cooperatively with the QC personnel to accommodate the inspection and testing requirements.** The inspectors, record keeper, and testing technicians must meet the following:

(a) Inspector. Inspectors who perform inspection work shall be civil engineering technicians with at least 2 year of experience in inspection of highway/bridge construction or similar construction which includes basic sampling and field testing of materials, welding, basic surveying, use simple plans and specifications, read topographic maps or be currently certified by NICET, Level I (or equivalent certification program) or higher in the sub-field of Highway Construction or an equivalent certification program. The Inspector is responsible for performing daily inspection and testing (i.e., compaction tests) of the work in place that he/she is **certified** for (i.e., structural welding, false work, embankment construction, pipe installations, nuclear gage operation, etc.) and prepares inspection and testing reports as outlined in the QCP. The Inspector is further responsible for reporting any deficiencies back to the QCM and Sub-AOTR. The Inspector shall not be allowed to inspect more items of work at one time than can be adequately accomplished in a day without sacrificing quality of the inspections and/or testing.

(b) Record Keeper. A record keeper who performs record keeping shall be person with at least one (1) year of experience, preferably in construction project filing; Be computer literate (Excel, Word, etc.); have basic knowledge in mathematics (computation of lengths, areas, etc.) unit conversion (English to Metric), ability to prepare agendas, minutes, track quantity estimates, update quantities daily and log data accurately into project records; **thoroughly knowledgeable in the government's records management requirements** through on-the-job training from the AOTR/Sub-AOTR. The record keeper shall also distribute records to the appropriate personnel on this project.

(c) Quality Testing Technician (Soils & Aggregates). Quality Testing Technicians who perform actual sampling and testing of soils and aggregates shall have 2 years or more of recent job experience and the following:

(1) Certified under a State DOT "Technician Training and Certification Program (TTCP)" in the field of soils and aggregates or other state/industry certification program in the field of soils and aggregates or;

(d) Quality Testing Technician (Hot Mix). Quality Testing Technicians who perform actual sampling and testing of hot asphaltic concrete shall have 3 years or more of recent job experience and the following:

(1) Certified under a State DOT "Technician Training and Certification Program (TTCP)" in the field of asphalt/asphaltic concrete.

(e) Quality Testing Technician (Concrete). Quality Testing Technicians who perform actual sampling and testing of concrete shall have 1 year or more of recent job experience and the following:

(1) Certified under the American Concrete Institute (ACI), "Concrete Field Testing Technician, Grade I".

The Testing Technician, under the direction of the QCM, is solely responsible for testing of materials **within their expertise**. Under no circumstance shall a Testing Technician/QC Inspector be performing tests outside their qualifications. Should the QCP identify a Testing Technician and/or Inspector to be performing both testing and inspection, they shall not perform outside their qualifications.

Add the following subparagraphs:

(f) Submittal transmittal, review, approval, and record keeping. Procedural requirements for transmittal, review, approval, and record keeping of submittals (Log of Submittals) shall be the responsibility of the Contractor consistent with the NRDOT format that shall be provided upon request. While use of the NRDOT specific forms and/or formats is not required, any other format used shall contain the same information. This form shall only be used for material certifications, shop drawings, mix designs, test/inspection reports, and résumé's for QCP staff.

> The Contractor or his elected representative shall prepare, in accordance with FAR 52.236-21, *Specifications and Drawings for Construction*, and Special Contract Requirements, 3 hard copies of all Shop Drawings and one electronic copy (AutoCAD 2004 or compatible software programs as per NRDOT requirements) with Certifications and submit to the NRDOT Manager through the AOTR for approval (unless otherwise instructed). Each submittal shall be accompanied with a Transmittal, Review, and Approval form (sample of acceptable form may be provided upon request) signed by the Contractor. Clearly mark each item proposed to be incorporated into the contract and identify in the submittals, with cross-references to the contract specifications and drawings, so as to identify clearly the use for which it is intended. Each submittal shall be certified by the Contractor. The Contractor's certification shall be worded as follows:
>
> "***It is herby certified, to the best of my knowledge, that the (document) (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into Contract Number _____, and is in compliance with the Contract specifications and drawings, and is submitted for Government approval."***

Certified by _____ Date _____

The person signing the certification shall be the Project Superintendent or one who is designated in writing by the Contractor as having the authority. The signature shall be in original ink. Stamped signatures are not acceptable.

(g) Manpower needs. The QCM shall coordinate with the AOTR/Sub-AOTR and Project Superintendent and agree on the level of inspection and testing man power needed for each week's work or operation in order for the AOTR to measure and pay for the testing and inspection work under this section.

The AO reserves the right to require changes in the QCP, QC personnel, and operations as necessary to ensure the specified quality of work to be performed in a safe manner. The Contractor can propose changes to the QC personnel by submitting a completed **"Submittal, Transmittal, Review and Approval Form"**, along with complete resume(s) of personnel to be added or replaced on the QC staff to the NRDOT Manager**, a minimum of seven (7) calendar days prior to a proposed change**. The resume and any proposed changes must be approved by the NRDOT Manager prior to implementation. Non-compliance with this requirement shall result in no payment for the hours claimed.

DO NOT use the **"Submittal, Transmittal, Review and Approval Form"** for submitting survey data or shop drawings. A separate letter explaining in detail what the submission is for with the information (maps, drawing, etc) attached on CD's with hard copies is required.

(h) Resumes. A resume of all QC staff shall be included in the QCP and must be very specific and detailed on the duration/dates of past and current education, work experience, duties and current certifications that relate to field of work that is specified in this contract. Copies of current certifications shall be included with the resume. The resume of any proposed Quality Control Manager, Inspector, Record Keeper and/or Quality Control Testing Technician shall meet the requirements as outlined in this section.

The Government reserves the right to contact past employers and/or interview any member of the QC organization at any time in order to verify his/her submitted resume and/or qualifications.

To minimize project disruption, and to maintain harmony, communication and project record keeping, the designated QCM, Inspectors, and Quality Control Testing Technicians shall stay with their assigned task/work until their respective task/work and records are completed to the satisfaction of the AOTR/Sub-AOTR. No QC personnel shall perform work on any other project/contract without the express written consent of the AOTR.

All QC personnel whose duties require them to drive a vehicle during their assigned duties, under this contract, must comply with a driving policy consistent with the BIA's driving policies and must possess a valid State driver's license.

153.03 Testing.

Add the following subparagraphs:

(a) Quality Control Laboratory.

Provide an AASHTO accredited testing laboratory qualified to perform sampling, testing, and inspection required by this contract. Only the AASHTO accredited testing laboratory

identified and approved in the Contractor's Quality Control Plan shall perform sampling, testing and inspection on the project.

(b) Accredited Laboratories

The acceptable accreditation programs are the American Association of State Highway and Transportation Officials (AASHTO) program, and the Cement and Concrete Reference Laboratory (CCRL). Furnish to the NRDOT Manager Accreditation documentation including, a copy of the Certificate of Accreditation, and Scope of Accreditation. The scope of the laboratory's accreditation shall include the test methods required by the contract.

(c) Inspection of Testing Laboratories

The testing laboratory facilities and records may be subject to inspection by the Contracting Officer and/or NRDOT Manager. Records subject to inspection include equipment inventory, equipment calibration dates and procedures, library of test procedures, audit and inspection reports by agencies conducting laboratory evaluations and certifications, testing and management personnel qualifications, test report forms, and the internal QC procedures.

(d) Test Results

Cite applicable contract requirements, tests or analytical procedures used. Provide **all original** actual test results and **worksheets.** Include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM"" to the specification requirements, whichever is applicable. Test results shall be signed by a testing laboratory representative authorized to sign certified test reports. Furnish the **original** signed reports, certifications, and other documentation to the AOTR/Sub-AOTR within one (1) calendar day after the performance of the test. Furnish a summary report of field tests at the end of each week in a format to the satisfaction of the AOTR/Sub-AOTR. Attach a copy of the weekly summary report to the last daily Contractor Quality Control Report of each month.

If an Inspector or Quality Control Testing Technician performs work, but has not been approved on the QCP personnel list, all test results and/or inspection work performed and hours claimed by the non-approved Inspector or Quality Control Testing Technician shall be rejected. The rejected work shall comply with Section 106-Acceptance of Work, Subsection 106.01 Conformity with Contract Requirements. The work hours claimed shall not be paid for.

153.04 Records.

Add the following to the first paragraph:

In accordance with the Government's Records Management requirements, the QCM and Contractor Superintendent shall be **responsible** for the measurement of quantities (including all verification of calculations, sketches, etc.) of all items of work in accordance with **Subsection 109.01** and these measurements (quantities and calculations) kept in chronological order and in bound record books (bound books can be the steel strapped press board type or survey/lab grade) in a format agreed to by both the QCM and AOTR/Sub-AOTR. **These record books shall be updated daily throughout the life of this contract**. The measurements for accepted work shall be based on material certifications, testing reports, inspection reports, and any other appropriate documents that have been reviewed and verified by the AOTR/Sub-AOTR in writing. Copies of material measurements shall be furnished to the AOTR/Sub-AOTR and Contractor for review,

approval, and preparation of progress pay estimates. Any **errors/mistakes** found by the AOTR/Sub-AOTR shall be corrected immediately by the **QCM** as outlined in this subsection and in accordance with the Special Contract Requirements 4(b) unless the Contractor can clearly show documentation otherwise.

The quantities, sketches, calculations entered into the quantity books shall be done in a neat and legible fashion. Any mistakes shall be scratched out with one red ink line and corrections shown above or below the figure, red lined out, with the writer initializing off and dating the corrections. **Under no circumstance shall erasure of errors or white out corrections be made in any book.**

The QCM is also responsible for all inspection reports, test records, correspondence, material certifications, as-built plans, etc. in accordance with the BIA Record's Management policies, procedures, and requirements. These records must be kept in and approved format and secured bound book (i.e., survey quality note books). **No 3 ring binders allowed. Under no circumstances shall any QC personnel alter any previous report(s) without notifying the AOTR/Sub-AOTR first and the AOTR initials off on the corrections.**

Allow unrestricted access by the government for inspection and review of the quantity and other record book(s) at all times.

Revise the certification statement by adding "*by the Contractor*" between the words "*certified*" and "*that*".

Add the following subparagraph:

(a) As-built drawings. The QCM is required to keep the as-built drawings updated on a daily basis and accurately marked to show all deviations, which have been made from the original contract drawings. The QCM shall initial each deviation and each revision.

The QCM shall maintain, at the job site, one set of full-size contract drawings labeled "***As-Built***" (either in AutoCAD format or red lined hard copy) marked in legible red pencil to show any deviations which have been made to the contract drawings, including buried or concealed construction and utility features revealed during the course of construction. The QCM shall record horizontal and vertical locations of buried utilities that differ from the contract drawings. Show the size, manufacturer's name, model number, capacity, and electrical power characteristics of the equipment installed. These drawings shall be available for review by the AO and/or AOTR/Sub-AOTR at all times. **No progress payment(s) shall be considered for the quality control bid item if marked prints are not shown to be current and request for final contract payments shall not be approved until the required drawings are delivered to the AOTR/SubAOTR in hard copy or electronic AutoCAD format within three (3) calendar days after the Final Inspection date.**

Upon submittal of the as-built plans to the AOTR/Sub-AOTR, the QCM shall provide a certification statement to the following:

> "***It is herby certified, to the best of my knowledge, that the As-Built Plans marked and documented are accurate and herein complies with the requirements in Contract Number _____, and are in compliance with the Contract specifications and are submitted for Government review and approval."***

Certified by _____ Date _____

(b) Project Records for Audit. The QCM and AOTR/Sub-AOTR shall jointly determine a format for project record keeping while being consistent with the BIA Records Management

requirements. This format must include contract item quantities, material certifications, and any other information deemed necessary and related to the contract item for audit purposes and conform to the BIA records management requirements. The QCM shall review all project documents and final quantities for each item of work in this contract and submit the final **original** quantity books, inspection records, material certifications, test records, log of submittals, etc. and the "As-Built" construction plans to the AOTR/Sub-AOTR for final audit purposes within **3** calendar days **after** the Final Inspection date or just prior to the final acceptance inspection if agreed to by the AOTR. The AOTR (in conjunction with the BIA Audit Engineer) will review the final quantity books and all other records for completeness within 30 days of receiving such documents. As an incidental obligation of the Contractor, the QCM shall be made available for meeting with the AOTR and/or BIA Audit Engineer to answer any questions relating to the final quantities and/or project records. Any project file records quantity book(s), "As-Built" construction plans, inspection reports, material certifications, etc.) that are found to be incomplete or lacking information shall be returned to the QCM and Contractor for corrections at the entire expense of the Contractor. The QCM shall be available and in contact with the BIA Audit Engineer during this review stage to insure compliance with audit requirements until the audit has been completed.

153.06 Measurement

Supersede this subsection as follows:

Measure Contractor Quality Control, including sampling, testing, and inspection by the Man Hours or Lump Sum as shown on the bid schedule.

Measurement by the Man-Hour for payment shall include the following:

1. A detailed daily confirmation report prepared by the QCM indicating the number of hours worked each day on the project of all QC staff subject to the review and approved by the AOTR/Sub-AOTR. This report shall be submitted to the AOTR/Sub-AOTR at the end of each day's work with a weekly summary.

2. Only those Inspectors/Testing Technicians, and QCM actually on the project performing work (or work at a fabrication plant) under this section during the contract time period based on the date of the Notice to Proceed notice issued by the AO.

Man-hours **not measured** for payment include the following:

1. QC inspection and testing man-hours during period(s) of project shutdowns, period after "Contract Ending" date, time outside the normal work day used in performing retesting of work due to QC personnel mistakes (i.e. improper testing methods, defective equipment, or improper use of equipment) or lack of keeping all records current as outlined herein (for example catch-up paperwork from previous work day(s) or correcting mistakes).

2. Any other testing and/or inspection of Contractor's work beyond the Final Inspection date shall be considered incidental obligations of the Contractor and those QC hours shall not be measured for payment.

3. The project records and "As-Built" construction plans shall be released to the AOTR/Sub-AOTR within 3 calendar days **after** the Final Inspection date. Measurement of QC hours shall cease upon the Final Inspection date.

4. Travel time for each inspector/tester and QCM (i.e. from the main office to the project or from temporary living quarters to the project and return) including travel time for an inspector, tester or QCM to deliver samples to the central laboratory and back to the project site or temporary living quarters shall be considered incidental obligations under terms of this contract.

5**.** All other QC Central Laboratory/Office personnel performing indirect work on this project (i.e. such as administrative staff, Materials Engineers, Project Manager, other geotechnical staff, etc.) shall be considered incidental obligations under the terms of this contract unless specifically addressed in a contract modification for purposes of addressing a specific problem unknown to both the contractor and government.

6**.** QC Central Laboratory personnel performing any quality tests (including but not limited to) aggregate base coarse, mineral aggregate, aggregate gradations, soil classifications, PIs, lime stabilization mix designs, hot mix designs, and concrete mix designs. Concrete cylinder breaks, TSR's and any other test(s) that are more cost effective to the government to be perform elsewhere or required inspections of structural members at fabrication plants will not be measured for payment unless otherwise agreed to in writing between the NRDOT Manager and Contractor and that such work is specifically and clearly identified in the approved QCP. Project QC personnel performing any quality sampling and testing (i.e. borrow pits, aggregate pits, etc.) during the contract period shall be considered incidental obligations under the terms of this contract.

7.Any QC personnel that are not identified on the approved QCP or subsequent revised and approved QCPs.

8.Travel time for an inspector/tester/QCM to travel to a concrete/asphalt batch plant.

9.No "stand-by time" shall be paid but shall be considered incidental obligations under the terms of this contract. Stand-by time shall be defined as time when the Contractor is shut-down or work delayed due to weather, equipment break-down, supplier's delivery delayed (i.e. concrete, ABC, hot mix, etc.) or any other work delay(s).

Add the following subsection:

153.07 Payment

The accepted quantity, measured as provided above, will be paid at the contract price per unit of measurement for the pay item listed below that is shown in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

When the Contractor Quality Control is based by the "lump sum" including sampling, testing, and inspection then it shall be paid as follows:

(a) 10 percent of the lump sum, not to exceed 0.5 percent of the original contract amount, will be paid after all the Contractor Quality Control Plan is approved and all the testing and inspection facilities are in place, qualified sampling, testing and inspection personnel are identified, and the work being tested has started.

(b) Payment for the remaining portion of the lump sum will be prorated based on the total work of all other bid items completed.

When the Contractor Quality Control is based on Man-Hours, the AOTR will make progress payments, in accordance with section 153.06, at the contract price per unit of measurement for the pay items listed below and as shown on the bid schedule. Any hours claimed for work beyond the contract ending date as shown in these contract documents (including any extensions approved by the AO) shall not be measured for payment. If the contract time is extended then this action by the AO will be taken into consideration when establishing the new contract ending date so that valid QC hours would be paid for during this extended period. It is only after this time expires that the QC hours will not be measured for payment as technically the contract is ended.

Payment will be full compensation for the work prescribed in this section unless otherwise described herein and in the special contact requirements.

Payment for all or part of this item of work may be retained, if the Government cannot agree on the hours claimed, or verification testing or inspection invalidates the Contractor testing or inspection work.

Payment will be made under:

Pay Item	**Pay Unit**
15301-0000 Contractor Quality Control	Man-Hrs
15302-0021 Contractor Quality Control	Lump Sum

SECTION 154--CONTRACTOR SAMPLING AND TESTING

154.01 Description.

This paragraph is superseded with the following:

This work consists of obtaining samples for testing and reporting required test results. There is no contract pay item for this work. This work does not include Contractor quality control testing required under Section 153. However, include the work required under this Section in the Section 153 Quality Control Plan (QCP).

154.02 Sampling.

The second sentence of the first paragraph is superseded with the following:

The sampling schedules and times shall be determined and provided by the Contractor's QCM using a random number system. Provide the schedules at least seven (7) calendar days before the work begins.

The first sentence of the second paragraph is superseded with the following:

The Contractor's QCP shall include a very specifically written method of sampling materials from a final processed windrow on the roadway, aggregate stockpile(s), behind a "jersey spreader", behind a chip spreader, out of a haul truck or any other acceptable method the Contractor is using to place or spread aggregate materials. Include sampling aggregates at the crushing site and/or hot plant site.

Add the following:

Splitting: A riffle sample splitter shall be used that meets AASHTO T-248. The QCP shall include a very specific written method of splitting and the number of splits the aggregate materials will take. Immediately perform splits of samples upon receiving the material. Furnish approved containers for the Navajo Region Division of Transportation's (NRDOT) portion of split samples. Label NRDOT samples to include project number, contract number, pay item number, material type, sample number, date sampled, time sampled, station location, distance left or right of centerline location, name of person sampling, name of person witnessing sampling and type of test required on sample. The Sub-AOTR will take possession of the BIA samples.

Allow the AOTR/Sub-AOTR and/or Regional NRDOT staff engineer/technician the opportunity to witness all sampling and splitting.

154.03 Testing.

This subsection is superseded with the following:

The Contractor's Quality Control Testing Technician or Inspector shall perform all tests required by the Sampling and Testing Tables for all applicable work. Allow the AOTR/Sub-AOTR and/or NRDOT staff the opportunity to witness all testing. Testing of trial samples may be required to demonstrate testing competence.

Use equipment that is calibrated and meets the applicable testing requirements of the contract. Tag all necessary equipment indicating the date of last inspection, inspector, and calibration number.

The AOTR may check equipment to verify condition and calibration. The Contractor shall repair or replace equipment not meeting applicable requirements.

Submit documentation supporting the calibration of all necessary equipment **before actual testing**. Include the following:

1. Description of the equipment calibrated or verified, including model number, serial number, or other acceptable identification.

2. Identification of the individual performing the calibration or verification.

3. Identification of the calibration or verification procedure used.

4. The calibration number for each calibration.

154.04 Records.

This subsection is superseded with the following:

Record test results on approved acceptable forms containing all the information as required in 154.02. Furnish to the AOTR/Sub-AOTR all original completed forms with original test results and work sheets. When tests are on material being incorporated in the work, report all test result(s) and original completed form(s) within 24 hours of date of test. **Payment for work will be delayed or work suspended until test results are provided.**

154.06 Measurement.

This paragraph is superseded with the following:

Do not measure Contractor sampling and testing for payment.

154.07 Payment.

This subsection is deleted in its entirety.

SECTION 155 -SCHEDULES FOR AONSTRUCTION AONTRACTS

155.02 General.

The first sentence of the third paragraph is superseded with the following:

Use the Bar Chart Method (BCM) as described below to develop the construction schedule for the total contracted work.

155.03 Bar Chart Method (BCM).

Add the following subparagraph (c):

(c) Submit **3 copies** of the construction schedule at the preconstruction conference. Allow **14 days** for acceptance or rejection of the construction schedule or a revised schedule. If rejected, submit a revised schedule within 5 days. **Do not begin work,** except mobilization, survey staking, and traffic control work, without an accepted construction schedule**.** The Contractor shall update this Construction Schedule as necessary (during the life of the project) to reflect any delays, change in schedules, and revisions to activities shown and furnish a copy to the AOTR/Sub-AOTR and/or NRDOT Manager when necessary for review and approval/disapproval back to the Contractor through the AO. The preparing, furnishing and updating of this bar chart schedule shall not be measured for payment but shall be a subsidiary obligation of the Contractor. Failure to provide the government with an updated construction schedule, for review and acceptance prior to continuation of work, may result in the AO issuing a stop work order.

Review and acceptance of any and all construction schedules is rendered as a service only and is not considered a guarantee of the work being completed within the contract time or will not result in delays as a result of the work under the schedule(s), nor shall it be considered as relieving the Contractor from complying with the specifications and other requirements in this contract.

155.04 Critical Path Method (CPM). This subsection is deleted in its entirety.

155.09 Payment.

This subsection is superseded with the following:

The development and updating of the construction schedule will not be measured for payment but shall be considered an incidental obligation of the Contractor under this contract.

156.03 Accommodating Traffic During Work.

The first paragraph is superseded with the following:

The Contractor shall prepare a Traffic Control Plan (TCP) in accordance with Section 635, the MUTCD latest edition, and the details shown in the construction drawings and submit for review and acceptance. Accommodate traffic according to the approved TCP, the MUTCD, Section 635, and this section.

156.08 Traffic and Safety Supervisor.

The first sentence of the first paragraph is superseded with the following:

Provide a traffic and safety supervisor who is certified by a federal or other acceptable certification program. Provide current copies of the certifications to the AOTR for review and approval.

Section 157. - SOIL EROSION CONTROL

157.01 Description.

This paragraph is superseded with the following:

This work consists of developing a **Storm Water Pollution Prevention Plan** (SWPPP), implementing and maintaining this plan to control erosion, pollution, sediment, and runoff during the construction of the project, use of borrow pit, haul roads, construction yards, and aggregate/soil stockpiles.

157.03 General.

The second paragraph is superseded with the following:

The storm water pollution, erosion, sediment, and runoff control details in the contract plans reflect special measures to be considered in the SWPPP for the project. The Contractor shall prepare and submit to the NRDOT Manager a SWPPP in compliance with all 401, 402, and NPDES permit applicable requirements (in full details, hand sketches not allowed) and reflecting the requirements in the contract plans and specifications in such detail that the plan will adequately address the potential for erosion of soil and other pollutants into the waters of the USA, on the entire project, due to each phase of the Contractor's grading and drainage operations. The SWPPP must be prepared by a **qualified registered professional engineer or a qualified storm water pollution prevention specialist** with the certificates and registration incorporated into the SWPPP. The SWPPP shall show measures to control erosion, runoff, sediment, and pollutants (to the fullest extent possible) and shall further address the following:

1. Measures to be taken at the toe of fill slopes (i.e., silt fencing, straw bales, etc.) that have the potential of eroding into the waters of the USA. This includes all slopes steeper than 1:3. However, this does not preclude the use of erosion control measures taken on slopes flatter than 1:3 depending upon the soil type and it's erosive potential as directed by the AOTR.

2. Measures to be taken in cut sections to preserve the back slopes and shoulder ditches from eroding into the waters of the USA. This includes placement of silt fencing spaced every 60 meters maximum (or as shown on the plans) in the cut ditches. Place straw bales along the upper ridge lines of the cut slopes or use of wattles to redirect runoff away from cut slopes. **The use of straw bales in cut ditches is not permitted**. See also subsection 157.04(H).

3. Measures to be taken to protect all live streams, lakes, ponds, creeks, and wetlands from sediment infiltration in accordance with the contract plans and 404 wetland permit and EA requirements.

4. Details of sediment control structures (facilities) and locations where runoff is temporarily being diverted from its natural course;

A. Structures utilizing compacted earth material shall be composed of material free of roots, woody vegetation, excessive rocks, and other objectionable materials. The construction shall be in accordance with section 157.06(b).

B. The slopes of any settling basin shall be 1:3 or flatter. All settling basins shall have safety fence (1.2 meters in height snow fence or equivalent) enclosing them.

C. Measures for maintaining all sediment control facilities at all times of the day and night.

5. Measures for diversion dikes to be constructed at the end of each day's operation, as necessary, around all drop inlets to divert runoff into existing sediment basins (traps) or into outfall chutes.

6. Measures to install permanent erosion and sediment controls as soon as practical when sections of final grading and drainage work are complete.

7. Other erosion and pollution control measures and permits required due to the nature of the contractor's construction sequencing and procedures including temporary turf establishment, temporary mulching, type of erosion control materials to be used, and installation procedures for such things as (but not limited to) :

A) protection of soil and aggregate stockpiles.
B) protection of temporary cut and fill slopes
C) protection for detour roads.
D) temporary watering ponds.
E) protection of top soils.
F) protection of waters from pollutants

8. A **Construction Sequencing Plan** (CSP) that addresses each phase and location of the grubbing, grading, and drainage work to take place over the course of the contract.

The erosion and pollution control measures installed shall remain in place and be continuously maintained until the permanent measures (i.e., seeding and mulching of slopes, outlet protections, channel lining, etc) are completed. The Contractor can remove any SWPPP features at their discretion once all the permanent erosion control features are in place and accepted for those completed areas of the project. Failure to properly maintain the SWPPP may result in a violation of the Clean Water Act with possible fines levied by the USEPA. The Contractor shall have 5 working days from given notice of non-compliance to correct the problems. Failure to bring the work under this section into compliance within 5 working days of non-compliance notice will be cause for the Government to begin deducting the prorated progress payments for this work from the contract.

If field conditions change as a result of the contractor's construction operation which causes the SWPPP to be ineffective, then the Contractor shall revise the SWPPP and resubmit for review and approval. No work within the areas of deficiencies, identified by the QC inspector's and/or BIA project management personnel, shall be allowed until the revised SWPPP is approved and implemented.

Any deviations to the approved SWPPP shall be requested in writing at least 14 calendar days before implementation for review and approval. Minor adjustments in the approved SWPPP are allowed to meet actual field conditions. Any major deviation from the approved SWPPP will result in a notice of violation of the Clean Water Act where fines may be levied by the USEPA.

If the AOTR finds that the SWPPP is not providing sufficient erosion control protection, the Contractor shall be required to stop all work in the area and revise his SWPPP to address the problems immediately and when the revised SWPPP is approved, immediately implement the changes.

Allow 30 calendar days for review and approval of the initial SWPPP in accordance with Subsection 104.03.

157.04 Controls and Limitations on Work.

The first paragraph is superseded with the following:

Before grubbing and grading work begin, the contractor shall construct all pollution, erosion, and sediment control measures around the area to be worked on including any perimeter erosion and sediment control measures. This shall include the construction of sediment traps, filter barriers, diversion dikes, silt fencing, and settling structures as required by the approved SWPPP.

Paragraph three is superseded with the following:

Construct erosion control and sediment control measures as follows:

A) Construct temporary erosion controls in incremental stages as construction proceeds in accordance with the **Construction Sequencing Plan** (CSP).

B) Construct temporary slope drains, diversion channels, and earth berms to protect disturbed areas and slopes as reflected in the approved erosion control plan.

C) Apply permanent turf establishment (i.e. seeding & mulching) in accordance with section 625 on sections of completed slopes and other disturbed areas within 10 days of final grading.

D) Construct temporary outlet protection on all new and existing culverts and other drainage structures in accordance with the details shown in the contract plans and the approved SWPPP.

E) Construct permanent erosion controls (as shown in the contract plans and specifications) including waterway linings, slope treatments, gabions, riprap, and permanent sediment traps within 20 days of completion of the roadbed and/or drainage structures.

F) Apply permanent turf establishment and landscaping to finished slopes and ditches according to section 624 through 629 as required.

G) Construct and maintain erosion controls on and around all soil and aggregate stockpiles within the project limits to prevent soil loss into the waters of the USA.

H) During each day's grading operations, shape and roughen all embankment slopes to minimize and control erosion from storm runoff as follows:

1. For cut and fill slopes run a bulldozer or other approved track equipment up and down the slope to create grouser tracks parallel to the roadway leaving small (approximately 51mm in depth) valleys in which water can be trapped (see design drawings for further details). This work is an incidental obligation of the contractor under item 15701-0000.

2. 2. Place straw mulch under bid item 15708-1000 (as required) to cover all completed slopes (and other disturbed areas) that cannot be traced under (1) above. Crimp the mulch by running a crimping tiller up and down the slope or use a polymer tacifier if crimping is not possible. This method of slope protection shall also be used when permanent seeding, under bid item 62510-1000, cannot be completed within 10 days of final grading. Placing of straw mulch, tacifier, and crimping shall be an incidental obligation of the Contractor under item 15708-1000. The mulch shall be applied at a rate of 4500kg/ha. Apply tacifier at a rate of between 44-67kg/ha or as recommended by the manufacturer.

157.12 Inspection and Reporting.

The first paragraph is superseded with the following:

The **qualified** Erosion Control Representative (ECR) assigned by the Contractor in writing, responsible for implementation of the SWPPP shall inspect, and report on all erosion control features and facilities at least once every week, within 24 hours after more than 10mm of rain event in a 24-hour period, and as required by the approved SWPPP and/or US EPA permitting requirements. The Contractor Erosion Control Specialist responsible for the preparation of the SWPPP shall perform monthly inspections with the AOTR and ECR of the project and provide a report of his findings to the AOTR within 3 days after the inspection.

157.13 Maintenance and Cleanup. The third paragraph is superseded with the following:

Remove and dispose of all remaining temporary erosion control measures (SWPPP) two weeks prior to final inspection and clean up all debris. Remove and dispose of erosion control measures according to subsection 203.05.

157.15 Measurement.

Add the following:

It is estimated that approximately 50 meters of silt fence, and 25 meters of straw bales and/or wattles or sand bags will be required for the project. However, this does not preclude the Contractor from using any or all of the other measures shown in the design plans and/or measures required in the Contractor's SWPPP as a result of the construction sequencing. Those measures required by the Contractor's SWPPP shall be included in the unit price bid for erosion control.

Temporary straw mulching shall be measured by the hectare (ha) in place. Any secondary applications or touch ups as directed by the AOTR shall not be measured for payment but shall be incidental obligations under this items of work.

157.16 Payments.

Add the following:

When the bid schedule does not contain a bid item for this work, it shall be considered incidental obligations of the contractor under other bid items of work where no additional payment shall be made.

When soil erosion control is bid by the Lump Sum, payment shall be made as follows:

(A) 25 percent of the Lump Sum, not to exceed 0.5% of the original contract amount shall be paid after all required erosion control measures sufficient to begin construction as determined by the AOTR are in place.

(B) Payment for the remaining portion of the Lump Sum shall be prorated based on the total work completed, provided the additional and necessary erosion control measures are constructed, maintained, and accepted.

Payment will be made under:

Pay Item	**Pay Unit**
15701-0000 Soil Erosion Control	Lump Sum
15708-1000 Temporary Straw Mulching	hectare

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SECTION 204- EXCAVATION AND EMBANKMENT

204.04 Preparation for Roadway Excavation and Embankment Construction.

Add the following:

Earthwork construction requiring compaction shall not be performed unless the air temperature is 4° C and rising (taking into account the wind chill factor) and the top 305mm of ground and/or roadway embankment (including all backfill previously placed) temperature is a minimum of 4°C in the shade. The AOTR shall make the final determination (in writing) as to whether earthwork construction can proceed or not.

204. 07 Subexcavation:

The first sentence is superseded with the following:

Excavate unsuitable material and replace with select borrow meeting the requirements of section 704.07 to a depth of 610mm from existing subgrade or natural ground, and to the limits designated by the AOTR. The sub-excavation work shall be measured and paid for at the contract unit price for Roadway Excavation, item 20401-0000, as applicable. The select borrow shall be measured and paid for at contract price for item 20403-0000 as applicable. When items for roadway excavation or select borrow is not in the bid schedule, measurement and payment shall be in accordance with section 109.02(m) or other approved methods.

204. 10 Embankment Construction:

(b) Embankment Construction within the roadway prism.

The first sentence, in the first paragraph, is superseded with the following:

Within the roadway prism, place earth embankment in horizontal layers not exceeding 300 Millimeters loose measurement.

Add the following:

In no case shall any embankment lift material be placed upon frozen, muddy, or unstable natural ground or existing embankment. If existing subgrade or natural ground is wet and/or unstable due to conditions not attributable to the contractor's operations, it shall be plowed and/or scarified to a depth of 457mm and aerated before compacting (in accordance with section 204.11) as directed by the AOTR. This work shall be measured and paid for under the roadway excavation items in the bid schedule. When items for roadway excavation is not in the bid schedule, measurement and payment shall be in accordance with section 109.02(m) or other approved methods. Any subgrade and/or natural ground that is wet or unstable as a result of the contractor's construction operations shall be stabilized as described above at the Contractor's entire expense.

204. 11 Compaction:

Add the following to 204.11(b):

The contractor shall compact the following materials listed below until a uniform density of not less than 95% of maximum density is obtained as determined in accordance with 204.11(a), (b), or (c) :

(1) Material placed in all embankment layers in accordance with section 204.10.

(2) Scarified material in the upper layer of existing ground in accordance with section 204.06 and 204.09 respectively:

(1) Under the subgrade in cut sections.
(2) Under embankments in fill sections.

204.13 Sloping, Shaping, and Finishing:

The first 3 sentences of subsection 204.13(d) are superseded with the following:

Remove all material larger than 150mm from the top 305 mm of finished roadbed and replace it as required with suitable material. The top surface of the finished subgrade shall not vary more than finished red top staking required in section 152.03(f) in both transverse (full width of roadway) and longitudinal directions (every 20 meter station maximum) and be continuously maintained in accordance with section 156 for public traffic until project completion. Continuously maintain all roadside ditches for proper drainage until final acceptance of project.

204.15 **Acceptance**: Add the following to the second paragraph:

All government computed final earthwork quantities shall be based on approved Contractor furnished final cross sections taken on the roadway, channels; borrow areas, and roadway prism cut and embankment sections in the final position shown graphically and in electronic printouts and data files specified in section 152. Any over built roadway typical embankments and/or cuts (not authorized by the AO) shall be deducted from the final earthwork quantities. The NRDOT Highway Design Section will take the Contractor's final survey data to determine the final earthwork quantities and furnish the results to the AOTR and Contractor through the AO.

204.16 Measurement:

Subparagraph (c)(1) is superseded with the following:

(1) Include the following volumes in embankment construction:

Roadway embankments that are in reasonable close conformance with the contract typical sections.

Material used to backfill sub-excavated areas, holes, pits, and other depressions.

Material used to restore obliterated roadbeds to original contours.

Material used for dikes, turnouts, and ditch blocks not paid under separate bid items.

204.17 Payment:

Add the following paragraph:

For periodic progress payment purposes, contract bid items for roadway excavation and borrow can be done by an approved load count method as agreed to (**in writing**) by the Contractor and AOTR and NRDOT Division Manager.

Table 204-1, Sampling and Testing Requirements shall be used as written, except the requirements for the "Top of Subgrade" material is superseded with the following:

Table 204-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Top of Subgrade (204.11)	Measured and tested for conformance (106.04)	Compaction	AASHTO T 310 or other approved procedures	1 per 2000 m^2	In-place	-	Before placing next layer
		Classification	AASHTO M 145	1 per 152 m	Top 305mm	Yes, when requested	Before placing next layer
		Sulfate Content[2]	AASHTO T 290	1 per 152 m	Center of lane; staggered	Yes, when requested	Before placing next layer

(2) Determine the sulfate content of <u>all</u> soils with soil classification of A-6 and A-7 when lime stabilization work is called for in the plans. If the soils have sulfate content of 2500 ppm or more, the Contractor shall take additional soil samples to determine limits of the high sulfate content soil area(s). The soils with high sulfate content shall be used to determine a lime/soil mix design under Section 213.

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SECTION 206-WATERING

Add this new section as follows:

206.01 Description.

This work shall consist of developing an adequate water supply and applying water for all contract items that require water, hauling, and applying water including turf establishment. This work shall also include furnishing and applying water for the control of dust caused by the contractor's operations and public traffic within the construction zones only and in a conservative manner (i.e. only apply water for dust control caused by the contractor's operations and public traffic use in those location on the project as identified and directed by the AOTR in accordance with section 158).

206. 03 General.

Water shall be applied at the project locations, in the amounts, and during the hours, including nights, and approved shutdowns, as directed by the AOTR and in a conservative manner. Water shall be applied by means of a pressure-type distributor or pipe lines equipped with a spray system that will insure a uniform application of water in the quantities necessary.

206. 05 Measurement.

No measurement of quantities will be made when the Bid Schedule contains a lump sum pay item for the development of water supply.

When the bid schedule contains quantities based by the M-liter (1,000,000 liters) then the actual verified quantity used per pay estimate shall be paid for. Measurement for payment shall be based upon a load count method where each water truck to be used on the project shall be weighed (by certified scales) empty and full to determine the capacity of each truck in liters. The scale man shall certify the volume of the trucks and provide a certification with volume calculations to the AOTR for review and approval prior to each truck used on the project. The Contractor shall then provide the QCM and AOTR with daily load counts of water used on the project. Any truck left (at the end of each day) with water in the tank shall not be measured for payment until all the water is used on work the following day. Only water actually used on the project shall be measured for payment that was authorized by the AOTR.

206. 06 Payment.

The contract lump sum amount will be paid in accordance with the following partial payments when the bid schedule contains a "Lump Sum" item:

A) 50 percent of the total contract lump sum bid amount will be paid for developing an adequate water supply.

B) The remaining 50 percent of the total contract lump sum bid amount will be paid on a prorated basis in accordance with the job progress.

When the Bid Schedule **does not** contain an Item for Watering, then Watering shall be considered incidental to the earthwork, road reconditioning, and/or paving items shown and no additional payment shall be made.

Payment will not be made for watering not directed by the AOTR.

Payment will be made under:

Pay Item	Pay unit
20601-0000 Development of Water Supply.....	M-Liter

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SECTION 209- STRUCTURE EXCAVATION AND BACKFILL

209.04 General.

The last sentence is superseded with the following:

Compact the foundation in accordance to Subsection 209.11.

209.09 Bedding.

Add the following:

Soil classification reports shall be submitted to the AOTR for review and approval prior to use of the bedding material.

209. 10 Backfill.

(b) Pipe culverts.

Add the following:

Soil classification reports shall be submitted to the AOTR for review and approval prior to use of the backfill material. Backfilling and compaction shall meet the temperature requirements of section 204.04.

Table 209-1 is superseded with the following:

Table 209-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Test Methods Specifications	Sampling Frequency	Point of Sampling	Reporting Time
Backfill material (704.03)	Measured and tested for conformance (106.04)	Gradation/Soil classification	AASHTO T27 & T11/ AASHTO M 145	1 per soil type	Source of material	Before using in work
		Moisture-density	AASHTO T 99, method C[(1)]	1 proctor curve per week or installation; to be determined by AOTR/Sub-AOTR	Source of material	Before using in work
		Compaction	AASHTO T 310 or other approved procedures	3 per lift	In-place	Before placing next layer
		Resistivity[2]	AASHTO T 288	1 per soil type	Source of material	Before using in work
Bedding material (704.02)	Measured and tested for conformance (106.04)	Gradation/Soil classification	AASHTO T27 & T11/ AASHTO M 145	1 per soil type	Source of material	Before using in work
		Moisture-density	AASHTO T99, method C[(1)]	1 proctor curve per week or installation; to be determined by AOTR/Sub-AOTR	Source of material	Before using in work
		Compaction	AASHTO T 310 or other approved procedures	3 per lift	In-place	Before placing next layer
		Resistivity[2]	AASHTO T 288	1 per soil type	Source of material	Before using in work
Foundation fill (704.01)	Measured and tested for conformance (106.04)	Gradation/Soil classification	AASHTO T27 & T11/ AASHTO M 145	1 per soil type	Source of material	Before using in work
		Moisture-density	AASHTO T99, method C[(1)]	1 proctor curve per week or installation; to be determined by AOTR/Sub-AOTR	Source of material	Before using in work
		Compaction	AASHTO T 310 or other approved procedures	3 per lift	In-place	Before placing next layer
Unclassified borrow (704.06)	Measured and tested for conformance (106.04)	Gradation/Soil classification	AASHTO T27 & T11/ AASHTO M 145	1 per soil type	Source of material	Before using in work
		Moisture-density	AASHTO T99, method C[(1)]	1 proctor curve per week or installation; to be determined by AOTR/Sub-AOTR	Source of material	Before using in work
		Compaction	AASHTO T 310 or other approved procedures	3 per lift	In-place	Before placing next layer
		Resistivity[2]	AASHTO T 288	1 per soil type	Source of material	Before using in work

(1) Minimum of 5 points per proctor. (2) Only required for backfill of steel drainage structures called for in the bid schedule in accordance with section 704.

SECTION 301--UNTREATED AGGREGATE COURSES

301.03 General.

Paragraph one is superseded with the following:

Seven (7) calendar days before the placement of any aggregate base material, the Contractor shall notify the AOTR or Sub-AOTR in writing advising the area(s) and location(s) where the base material will be placed. Immediately, prepare the final roadbed surface according to Section 204 or 303 as applicable. The AOTR and/or Sub-AOTR, QCM, and Contractor shall jointly check the final roadbed surface area(s) and location(s) for any defects. If defective areas are noted, correct all areas with moisture/density control. The above construction personnel shall recheck the entire final roadbed surface area(s). When approved and accepted by the government, the Contractor can place aggregate base material. The Contractor shall place aggregate base material **only** at government approved area(s) and location(s).

Paragraph two and three are deleted.

301.04 Mixing and Spreading.

Add the following:

The aggregate base material shall be placed on an approved, firm and stable roadbed in a continuous uniform layer or windrow. The layer or windrow shall be of such size that when spread and compacted the thickness of the finished layer shall conform to the nominal thickness shown on the plans or a thickness determined by the AOTR or Sub-AOTR.

Aggregate base shall be constructed on a dry, unfrozen surface where the air temperature is 4°C and rising (taking into account the wind chill factor) and the top 305mm of finished subgrade must be 4°C minimum in the shade. The AOTR shall make the final determination as to whether the work can proceed.

When the weather conditions (just prior to aggregate base placement) is projected to be foggy, showers, rain, snow, or the surface temperature drops below 4°C such that the ground is freezing (i.e., appearance of frost), no aggregate base course materials shall be placed.

Where aggregate base course is placed on geotextile materials, in order to prevent damage to the geotextile materials, the Contractor shall not process the bottom 51mm (2-inches) of the lower lift.

301.06 Surface Tolerance.

The first paragraph is superseded with the following:

Grade finishing stakes are required during the placement process. Finish the final surface to within the tolerances under section 152.03(f). The surface tolerance shall be checked by the string line method. Defective areas or surface deviations that do not meet the above tolerance shall be corrected. If spot dumping of base material is necessary to meet the staked line and grade

elevation(s), this material shall be added to the existing base material by scarifying down 76mm (3-inches), mix, blend, and process with moisture/density control (as required under subsection 301.05). Finish to the staked lines and grade elevation(s) and recheck for surface tolerance. This work shall be considered incidental obligations of the Contractor.

301.07 Maintenance.

Add the following:

This work shall be performed during construction and periods of suspended work as required under Subsection 107.06.

If the roadway with aggregate base course in place is used by traffic before the final surfacing is placed, it shall be maintained in a safe and adequate manner as directed by the AOTR/Sub-AOTR. Prior to the placement of the next base course layer, pavement layer or application of the prime coat, the aggregate base course in-place shall be checked (by QCM, AOTR/Sub-AOTR and Contractor) for defective areas. If defective areas are found, these areas shall be corrected to meet the requirements of subsections 301.05 and 301.06. This work shall be incidental obligations of the Contractor and no additional payment shall be made.

301.08 Acceptance.

The second paragraph is superseded with the following:

Aggregate gradation and surface course plasticity index shall be evaluated under Subsection 106.04 Measured or Tested Conformance. Other aggregate quality properties will be evaluated under Subsection 106.02 and 106.04.

Subparagraph **(a)** is superseded with the following:

(a) Aggregate gradation. The upper and lower specification limits are the values shown in Grading (D), Table 703-2 as modified in these supplemental specifications.

Materials, which fail to meet the aggregate gradation specification limits, shall be corrected by the Contractor by adding coarse and/or fine aggregate to bring the material into specification limits. The Contractor's Quality Control Testing Technician shall sample and test the corrected processed material. Repeat the corrective work until the aggregate base course gradation is within the upper and lower specification limits under Grading (D). Once the Contractor can show compliance with the contract requirements, then the material on the roadway, including any added aggregates shall be paid for at the full contract unit price. No separate payment for the added labor, overhead, traffic control, and equipment costs for adding coarse and/or fine aggregates shall be made but shall be an incidental obligation of the Contractor to bring the aggregate base course into contract aggregate gradation specification.

(b) Plasticity index. See table 301-1 for acceptance quality characteristics category.

301.09 Measurement.

Add the following:

When the bid schedule calls for the aggregate base course to be measured by the metric ton, only the natural moisture in the material will be included for payment. Should the Contractor add water before weighing (prewet), then the weight of the added moisture shall be deducted by the AOTR and QCM before payment is made.

No separate measurement or payment for the corrective work (i.e., additional labor, overhead, traffic control, and equipment costs) shall be made but shall be an incidental obligation of the Contractor to bring the aggregate base course into contract aggregate gradation specification. Once the material has been corrected to meet the specifications, then the material on the roadway shall be measured for payment at full contract price.

Any aggregate base material that is wasted, wasted along the shoulders, used for over-built roadway prism sections, material not used on the project and/or is not a part of the aggregate base course design roadway typical shall not be measured for payment. The AOTR and QCM shall determine and use a method of measuring the waste; measure any aggregate base used on over-built roadway sections and make the appropriate adjustments in the quantities before payments are made.

301.10 Payment.

The first paragraph is superseded with the following:

The accepted quantities, measured as provided above, will be paid at the contract unit price bid of which price and payment will be full compensation for the work prescribed in this section. See Subsection 109.05.

Roadbed preparation/reconditioning will be measured and paid for as specified under Section 204, 212, and/or 303, and/or 408 as applicable and as specified in the design plans. If there is no pay item in the bid schedule for roadbed preparation/reconditioning, then this work shall be considered incidental to completion of the project and no additional payment will be made.

Table 301-1, Sampling and Testing is superseded with the following:

Table 301-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance Subsection)	Characteristic	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Aggregate source quality 703.05 (a) & (b) or 703.05 (a) & (c)	Measured and tested for conformance (106.04)	LA abrasion (coarse)	AASHTO T 96	1 per type & source of material	Source of material	Yes, when requested	Before using in work
		Sodium sulfate soundness loss (coarse & fine)	AASHTO T 104	"	"	"	"
		Durability index (coarse & fine)	AASHTO T 210	"	"	"	"
		Fractured faces	ASTM D 5821	1 per type & source of material	Source of material	Yes, when requested	Before using in work
Base course grading C,D & E or Subbase grading A & B or Surface course aggregate	Measured and tested for conformance (106.04)	Gradation	AASHTO T 27 & T 11	1 per 400t	From windrow or roadbed after processing	Yes	Before using in work
		Liquid limit	AASHTO T 89 AASHTO T 90	1 per 400t	"		Before using in work
		Plasticity index [1]	AASHTO T 180, method D [2]	1 per 400t	"		Before using in work
		Moisture-density (max. density)		1 per week	"		Before using in work
		Compaction	AASHTO T 310, direct transmission	1 per 400t	In-place [3]		Before placing next layer
		Fractured faces	ASTM D 5821	1 per 1000t	From windrow or roadbed after processing		Before using in work
		Final thickness	Appropriate test by Contractor	1 per 400t	From windrow or roadbed after processing		Before placing next layer

1. The plasticity index shall be tested on the surface course aggregates only.
2. Minimum of 5 points per proctor.
3. At least one compaction test for all AOTRrected areas and turnouts shall be required. These tests shall meet the requirements under Section 301.

SECTION 402. - HOT ASPHALT CONCRETE PAVEMENT BY HVEEM OR MARSHALL MIX DESIGN METHOD

Description

402.01 This subsection is superseded with the following:

This work consists of constructing one or more courses of Marshall hot asphalt concrete pavement. Hot asphalt concrete pavement is Class B under Table 402-1 (see below). Aggregate grading is designated as Grading B under Table 703-4. Pavement smoothness/roughness measurements shall be taken. Asphalt binder is designated as shown in AASHTO M 20, M 226 or M 320. Antistrip additive shall be Type 3, Hydrated Lime as referenced in Subsection 702.08.

This work shall include repairing and patching any potholes or irregularities in the existing surface as delineated and directed by the AOTR. Remove and dispose of unsuitable material to a depth of 50mm; patch with hot asphalt concrete pavement.

Construction Requirements

402.03 Composition of Mixture (Job-Mix Formula). This subsection is superseded by the following:

Furnish mixtures of aggregate, asphalt, and antistrip additive (if required) that meet the applicable aggregate gradation
in Table 703-4 and design parameters provided under Table 402-1, as amended below and is capable of being placed and compacted as specified.

(a) Submission. Submit written job-mix formula and three (3) copies of asphaltic concrete mix design in accordance with ***AASHTO T 245 - Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus***, compacted at 50 blows, for review and approval at least 28 calendar days before production. Include the location of all commercial mixing plants to be used and a separate job-mix formula, if applicable. Include a signed statement prepared by the testing laboratory that certifies the proposed job-mix formula meets the requirements of the contract and can be compacted in the field during production to meet contract requirements.

The percentage of asphalt binder, by weight, to be added to the aggregate shall be between 5 to 7% of the total weight of the asphaltic concrete mixture. The percentage of hydrated lime to be added to the aggregate shall be between 1-2% by dry weight of aggregate. The mix design shall include graphs which contain at least four (4) asphalt contents versus the air voids, voids in mineral aggregate (VMA), flow, Marshall stability, maximum theoretical unit weight, Marshall unit weight, and voids filled with asphalt. For each job-mix formula submit the following:

Table 402-1
Asphalt Concrete Mix Requirements

Marshall – AASHTO T 245	**CLASS B**
1. Stability, N (lbs.)	8896 (2000)
2. Flow, 0.25 mm (0.01 inch)	1.5 -3.8 (6-15)
3. Percent Air Voids[1]	3 - 5
4. Voids in Mineral Aggregate, % Minimum	See **Table 402-2**
5. Compaction, number of blows each end of test specimen	50
Root-Tunnicliff – AASHTO T 283	
1. Tensile Strength Ratio, % minimum[3]	70
Dust-Asphalt Ratio[2]	0.6--1.3

[1] The percent of air voids are based on AASHTO T 166, AASHTO T 209, and AASHTO T 269. Maximum density will be based on AASHTO T 209. If the water absorption test value is greater than **2.0%,** the Rice density must be determined using the "dry-back" method.

[2] Dust-asphalt ratio is defined as the percent of material passing the 75 mm sieve divided by the percent of asphalt (Calculated by weight of mix).

[3] The TSR test data shall include the Freeze/Thaw cycle and must be reported in the final mix design. The minimum dry strength is 100 psi.

Table 402-2
Voids in Mineral Aggregate (VMA)
Marshall or Hveem Mix Design

Sieve Size[1]	**Minimum Voids** [2][3] **Percent**	
	Marshall	**Hveem**
4.75 mm	18.0	16.0
9.5 mm	16.0	14.0
12.5 mm	15.0	13.0
19 mm	14.0	12.0
25 mm	13.0	11.0

(1) The largest sieve size listed in the applicable specification upon which any material is permitted to be retained.
(2) VMA to be determined according to *AI Manual Series No. 2 (MS-2).*
(3) When a mineral filler or nonliquid antistrip is used, include the percentage specified in the calculation for compliance with the VMA.

(1) Aggregate and mineral filler.

(a) Target values:

(1) Target values for percent passing each sieve size for the aggregate blend; and
(2) Designate target values within the gradation band specified for the grading designation shown in Table 703-4.

(b) Aggregate source and percentage of each aggregate stockpile to be used.

(c) Average gradation of each aggregate stockpile.

(d) Results of aggregate quality tests for Contractor selected sources. Include the sand equivalent, fractured faces, Los Angeles abrasion, sodium sulfate soundness, coarse durability, fine durability, absorption, asphalt absorption, and specific gravities from tests performed within 1 year of aggregate use.

(2) Asphalt binder.

(a) Target asphalt binder content;

(b) Recent test results from the manufacturer for the asphalt binder including a temperature – viscosity curve;

(c) Material safety data sheets; and

(d) Mixing temperature range and minimum compaction temperature for the performance grade asphalt to be used in the mix.

(e) The specific gravity of the asphalt cement.

(3) Antistrip additives. If part of the job-mix formula:

(a) Name of the product;

(b) Manufacturer;

(c) Material safety data sheet; and

(d) Dosage rate.

(b) Verification. The Government will review and may perform design verification testing. If verification testing is performed, the information supplied in the Contractor's design must agree with the verification test results within the tolerances shown below.

(1) Aggregate gradations. Representative aggregate samples from each stockpile, when combined according to the contractor's recommendation for stockpile percentages, shall be within the gradation defined by the target values plus or minus the following tolerance for each sieve.

Sieve Size	**Tolerance, % (±)**
25 mm	3.0
19 mm	3.0
12.5 mm	3.0
9.5 mm	3.0
4.75 mm	3.0
2.36 mm	3.0
425 μm	2.0
75 μm	1.0

(2) Voids in mineral aggregate (VMA). The Contractor's VMA result is verified if the CO's result is not below the minimum specification limit.

(3) Marshall air voids, stability, and flow. The Contractor's results are verified if they meet the contract specifications in Table 402-1.

(4) Tensile strength ratio (TSR). The Contractor's percent retained strength result is verified if the Government's result is above the minimum specification value.

(c) Changes and re-submissions. If approved, the Government will issue **Job-Mix Formula No.1** (with an effective date) and a target value for the percent passing each sieve size for the aggregate blend, target value for the asphalt cement content, the mixing and compaction temperature ranges, and the asphalt concrete mix requirements as specified under Table 402-1.

Approval of the job mix formula, by the Government, does not relieve the Contractor of his obligation to furnish a quality mix that meets the specifications and other contract requirements. This includes the addition or lack thereof of antistrip additives or mineral filler as submitted in the Contractor's mix design.

If the job-mix formula and mix design is rejected or a material source is changed, submit a new mix design and job-mix formula for acceptance. The Government will review the new job-mix formula and/or mix design and may perform verification testing as specified under Subsection 402.03 (c).

Changes to an approved job-mix formula or target value(s) require approval before production. Up to 21 calendar days will be required to evaluate a change.

Approved changes in target value(s) or job-mix formula will result in issuance of a new **Job- Mix Formula Number** with an effective date. The maximum number of changes in target value(s) or job-mix formula is **three (3)**. Any requested changes above three (3) shall require submittal of a complete new mix design as described under 401.03 and Table 401-1 of the supplemental specifications and will be subject to verification testing as specified under 402.03 (c).

(d) Control of asphaltic concrete mixtures during construction. The Contractor's hot asphaltic concrete pavement mixture placed each day shall be tested, evaluated and accepted in accordance with Subsection 402.17. The Government may perform verification testing. If the Contractor's test results do not meet the requirements under Subsection 402.17 and/or fails to submit test results to the AOTR on the first acceptance sample within one (1) day after the sample is taken, the Contractor shall suspend all work on this portion of the contract until a written corrective action plan is submitted for approval to the Government and/or the test results are submitted to the

AOTR.

If the Government's test results do not verify the Contractor's test results, the Government's test results will be used for acceptance in accordance with Subsection 106.04 and Subsection 402.17. If the asphaltic concrete pavement mixture is rejected, the mixture shall be removed from the project site. Failure or refusal of the Contractor to remove the rejected control strip shall be grounds for the AO to either withhold any and all progress payments under the contract and/or Default of contract.

The Contractor's QC laboratory shall determine the maximum theoretical density (AASHTO T-209), air voids, voids in mineral aggregate (VMA), flow, Marshall stability, and Marshall unit weight on the **second acceptance sample**. The sample shall be taken every other day within one (1) weeks production beginning with the first day of full production. "Dry back" test method on maximum theoretical density specimen shall be performed if the approved hot mix design included this test method. Test results shall be given to the AOTR within one (1) day after the sample is taken.

The Contractor's QC laboratory shall determine the Root-Tunnicliff tensile strength ratio (TSR) test on the **second acceptance sample**. The sample shall be taken every other day within one (1) weeks production beginning with the first day of full production. Test results shall be given to the AOTR within **three (3)** days after sampling.

(e) Acceptance. Do not begin mix production until the job-mix formula is accepted by the Government.

402.04 Mixing Plant. Use mixing plants conforming to AASHTO M 156 supplemented as follows:

(a) All plants.

(1) Automated controls. Control the proportioning, mixing, and discharging of the mix automatically.

(2) Dust collector. AASHTO M 156, Requirements for All Plants, Emission Controls is amended as follows:

Equip the plant with a dust collector. Dispose of the collected material. In the case of baghouse dust collectors, dispose of the collected material or return the collected material uniformly. Use of baghouse fines in asphalt concrete mixes requires approval unless included as part of the approved job-mix formula.

(3) Recycled asphalt pavement. When recycled asphalt pavement material is incorporated into the mixture, modify plants according to the plant manufacturer's recommendations to process reclaimed material.

(b) Drum dryer-mixer plants.

(1) Bins. Provide a separate bin in the cold aggregate feeder for each individual aggregate stockpile in the mix. Use bins of sufficient size to keep the plant in continuous operation and of proper design to prevent overflow of material from one bin to another.

(2) Stockpiling procedures. Separate aggregate into at least 3 stockpiles with different gradations.

(c) Batch and continuous mix plants.

(1) Hot aggregate bin. Provide a bin with 3 or more separate compartments for storage of the screened aggregate fractions to be combined for the mix. Make the partitions between the compartments tight and of sufficient height to prevent spillage of aggregate from one compartment into another.

(2) Load cells. Calibrated load cells may be used in batch plants instead of scales.

402.05 Pavers. Use pavers that are:

(a) Self-contained, power-propelled units with adjustable vibratory screeds with full-width screw augers;

(b) Heated for the full width of the screed;

(c) Capable of spreading and finishing courses of asphalt mix in widths at least 300 millimeters more than the width of one lane;

(d) Equipped with a receiving hopper having sufficient capacity to ensure a uniform spreading operation;

(e) Equipped with automatic feed controls, which are properly adjusted to maintain a uniform depth of material ahead of the screed;

(f) Operable at forward speeds consistent with satisfactory mix lay down;

(g) Capable of producing a finished surface of the required smoothness and texture without segregating, tearing, shoving, or gouging the mix; and

(h) Equipped with automatic screed controls with sensors capable of sensing grade from an outside reference line, sensing the transverse slope of the screed, and providing the automatic signals that operate the screed to maintain grade and transverse slope.

402.06 Surface Preparation. Provide cleaning equipment including, but not limited to, power brooms, air compressors, water flushing equipment, and hand brooms for surface preparation. Clean the existing surface of all loose material, dirt, or other deleterious substances by using the above cleaning equipment and by approved methods. Apply an emulsified asphalt tack coat to contact surfaces of pavements, curbs, gutters, manholes, and other structures according to Section 412.

402.07 Weather Limitations. Place hot asphalt concrete pavement between **March 1 to December 1** of the calendar year **only**, unless the AO approves the Contractor's written request to place hot mix before or after the above dates. The Contractor must provide a written justification with his request. Approval by the AO will be on a weekly basis. Place hot asphalt concrete pavement on a dry, unfrozen surface when the air temperature in the shade is above 4ºC (40ºF) and rising and the temperature of the road surface in the shade conforms to Table 401-2.

Table 401-2
Asphalt Concrete Mix Placement Temperature

Compacted Lift Thickness →	**< 50 mm**	**50 - 75 mm**	**> 75 mm**
Road Surface Temperature °C	**Minimum Lay-Down Temperature[1] °C**		
< 2	(2)	(2)	(2)
2 - 3.9	(2)	(2)	138
4 - 9.9	(2)	141	135
10 - 14.9	146	138	132
15 - 19.9	141	135	129
20 - 24.9	138	132	129
25 - 29.9	132	129	127
≥ 30	129	127	124

(1) Never heat the asphalt concrete mix above the temperature specified in the approved mix design.
(2) **Paving not allowed.**

402.08 Asphalt Preparation. Uniformly heat the asphalt binder to provide a continuous supply of the heated asphalt binder from storage to the mixer. Do not heat asphalt binder above 175 ºC (350ºF).

402.09 Aggregate Preparation. For batch plants, heat, dry, and deliver aggregate for pugmill mixing at a temperature sufficient to produce a mix temperature within the approved range. Adjust flames used for drying and heating to prevent aggregate damage and contamination.

Control plant operations so the moisture content of the mix behind the paver is 0.5 percent or less according to AASHTO T 110 or FLH T 515.

When hydrated lime is used, it shall be added to and mixed with damp aggregates in a pugmill before entering the

dryer drum. The combined cold feed aggregate shall contain a minimum of two (2) percent moisture above SSD at the time the lime is mixed with the aggregates. The pugmill shall be a twin shaft, have a minimum length of 2.4 m (8 ft.) and the shaft paddles shall have a minimum diameter of 610 mm (2 ft.). The bottom of the pugmill shall conform to the configuration of the shaft. The hydrated lime shall be added to the aggregates such that loss of lime is minimal or non-existent. Placement of the lime on an open conveyor belt shall not be permitted. Placement of the lime on an enclosed conveyor belt that does not permit blowing or loss of the lime is acceptable.

The lime shall be weighed across a weigh belt or an approved alternative weighing system, with a weigh totalizing system before entry into the pugmill. The pugmill shall be located in the aggregate delivery system at a location where the mixed material can be readily inspected on a belt before entry into the drum. The pugmill shall be capable of effective mixing in the full range of the asphaltic concrete production rates.

A positive signal system and a limit switch device shall be installed in the plant at the point of introduction of the lime. The positive signal system shall be placed between the metering device and the dryer drum and utilized during production whereby the mixing shall automatically be stopped if the lime is not being introduced into the mixture.

Regardless of the weighing system used, the lime metering system or device shall be provided with a means for continuous automatic recording and a log or printout shall be given to the AOTR on a **daily** basis for each day's asphaltic concrete production.

402.10 Mixing. Measure the aggregate and asphalt into the mixer according to the approved job-mix formula. Mix until all the particles are completely and uniformly coated with asphalt according to AASHTO M 156. Maintain the discharge temperature within the approved range.

402.11 Hauling. Use vehicles with tight, clean, and smooth metal beds for hauling asphalt concrete mixes.

Thinly coat the beds with an approved material to prevent the mix from adhering to the beds. Do not use petroleum derivatives or other coating material that contaminates or alters the characteristics of the mix. Drain the bed before loading.

Equip each truck with a canvas cover or other suitable material of sufficient size to protect the mix from the weather. When necessary to maintain temperature, use insulated truck beds and securely fastened covers. Provide access ports or holes for checking temperature of asphalt mix in the truck.

402.12 Production Start Up Procedures.

(a) Pre-paving conference. At least 14 days before the start of paving operations, arrange for a pre-paving conference. Coordinate attendance with CO and all applicable subcontractors. Submit and prepare to discuss the following:

(1) Proposed schedule of paving operations;

(2) List of all equipment (excavation, compaction, laydown, haul, pugmill, etc.), and personnel used in the production and construction of the work;

(3) Proposed traffic control plan for paving operations including provisions for pavement drop-offs and moving operations;

(4) Contractor quality control plan for paving and sampling and testing according to Sections 153 and 154;

(5) Procedures for constructing the control strip including placing, finishing, compacting, and smoothness procedures; and

(6) Acceptance procedures according to Subsections 106.05 and 401.17.

(b) Control strip. Provide 7 days notice before beginning production of an asphalt concrete mix. On the first day of production, produce nine (9) truck loads of mix to construct a control strip, one-lane wide, and at the designated lift thickness. Construct the control strip on the project at an approved location.

The control strip is accepted at a pay factor of 1.00 if all test results as outlined under **(1)**, **(2)** and **(3)** are within

specification limits:

(1) Asphalt content and aggregate gradation. The Contractor's QC laboratory technician shall sample the 3rd, 5th and 7th truck load. These acceptance samples shall be tested and evaluated according to Subsection 402.17. The asphalt content upper and lower specification limits are the approved job- mix formula target value ± 0.4 percent. The aggregate gradation upper and lower specification limits are the approved job-mix formula target values plus or minus the allowable deviations shown in Table 703-4.

(2) Compaction. Take nuclear density readings behind each roller pass to determine the roller pattern necessary to achieve required density without damaging the mix. At a minimum of 10 locations within the control strip, take nuclear density readings, cut 5 core samples according to AASHTO T230, Method B. Test cores and evaluate the density test results according to Subsection 402.17. The density lower specification limit is **92%** of the maximum specific gravity (density). Furnish the AOTR with the nuclear gauge readings and correlations of the readings to the core specific gravities.

(3) Marshall air voids, stability, flow, VMA, Root-Tunnicliff tensile strength ratio (TSR), sand equivalent, and Rice testing. Determine the specific gravity, stability, flow, air voids, VMA, maximum density (Rice), TSR (includes the Freeze/Thaw cycle), and dust/asphalt ratio on an acceptance sample from the control strip. The sand equivalent shall be determined in accordance with Table 402-1. The Marshall air voids, stability, flow, VMA, Root-Tunnicliff tensile strength ratio, sand equivalent test results will be evaluated according to Subsection 402.17.

If the control strip does not meet the above requirements under **(1)**, **(2)** and **(3)**; the control strip will be rejected **by the AOTR in accordance with Subsection 402.17**. **If rejected, the rejected control strip shall be removed immediately off the project site.** Failure or refusal of the Contractor to remove the rejected control strip shall be grounds for the AO to either withhold any and all progress payments under the contract and/or Default of contract. Once the control strip is removed the Contractor can construct another control strip in the same location as the previous control strip. No other control strip can be constructed until the rejected control strip is completely removed off the project site. An accepted control strip will remain in place and will be accepted and measured as a part of the completed pavement. Tests used for accepted control strip will not be included in the evaluation for payment according to Subsection 106.05. The NRDOT Manager will make a recommendation to the AOTR for acceptance/non-acceptance of a control strip based on test data. When a control strip is accepted, full production can begin.

402.13 Placing and Finishing. Do not use mixes produced from different plants unless the mixes are produced according to the same job-mix formula, use material from the same sources, and are approved. Construct control strips according to Subsection 402.12 for each plant from which production is intended.

Place asphalt concrete mix at a temperature conforming to Table 402-2. Measure temperature of the mix in the hauling vehicle just before dumping into spreader or measure it in the windrow immediately before pickup.

Place the mix with a paver conforming to Subsection 402.05. Control horizontal alignment using a reference line. Automatically control the grade and slope from reference lines, a ski and slope control device, or dual skis. Use skis having a minimum length of 6 meters (20 feet).

In areas where mechanical spreading and finishing is impractical, place and finish the mix with alternate equipment to produce a uniform surface closely matching the surface obtained when using a mechanical paver.

Offset the longitudinal joint of one layer at least 150 millimeters (6-inches) from the joint in the layer immediately below. Make the longitudinal joint in the top layer along the centerline of two-lane roadways or at the lane lines of roadways with more than two lanes.

(a) Segregation. The bituminous mixture shall be transported and placed on the roadway without segregation. All segregated areas behind the paver shall be removed immediately upon discovery and replaced with specification material. If more than 4.6 square meter (50 square feet) of segregated pavement is ordered removed and replaced in any one continuous 152 meter (500 linear feet) of paver width, laydown operations

shall be discontinued until the source of segregation has been found and corrected. The COR/AOTR and QCM will determine the extent of segregated areas. The bituminous mixture shall be determined to be segregated when the percent passing the 4.75mm (No.4) sieve varies from the percent specified in the JMF by more than 9%. Segregated areas shall be corrected at the Contractor's own expense (this includes the QC Testing Technician sampling and testing the segregated area(s) for contract compliance).

402.14 Compacting. Thoroughly and uniformly compact the asphalt surface by rolling. Do not cause cracking, shoving, or undue displacement. Continue rolling until all roller marks are eliminated, all cracks are sealed, and the required density is obtained. Do not roll the mix after the surface cools below 80 ºC (175ºF).

Monitor the compaction process with nuclear density gauges calibrated to the control strip core density test results. Compact to a pavement specific gravity (density) that is no less than 92.0 percent of the maximum specific gravity (density) determined according to AASHTO T 209.

Cut 102-millimeter (4-inch) diameter core sample from the compacted pavement according to AASHTO T 230, method B. Fill and compact the core holes with asphalt concrete mixture. Label the cores and protect them from damage due to handling or temperature during storage. Perform specific gravity and thickness tests on the cores and deliver them to CO.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, compact the mix with alternate equipment to obtain the required compaction.

402.15 Joints, Trimming Edges, and Cleanup. Complete pavement construction of adjacent traffic lanes to the same elevation within 24 hours. If drop-offs are left overnight, sign the drop-offs in excess of 50 millimeters (2-inches) with *"Uneven Lanes"* warning signs and provide a 1:3 fillet for drop-offs in excess of 102 millimeters (4-inches).

At connections to existing pavements and previously placed lifts, make the transverse joints vertical to the depth of the new pavement. Form transverse joints by cutting back the previous run to expose the full-depth course.

To both transverse and longitudinal joints, apply an emulsified asphalt tack coat to the joint edge according to Section 412.

Place the asphalt concrete mix as continuously as possible. Do not pass rollers over the unprotected end of a freshly laid mix.

Dispose of material trimmed from the edges and any other discarded asphalt mix according to Subsection 211.02(a) (2).

402.16 Pavement Smoothness/Roughness. Measure the pavement smoothness of the final paved surface course after final rolling, within 14 calendar days of completing roadway paving, and before placing a surface treatment. The Contractor shall provide a separate temporary traffic control for the profilograph operation as an incidental obligation to the contract work. In addition, construct all pavement surfaces to meet the requirements of (c) below.

(a) International roughness index (IRI). Furnish an inertial profiler conforming to AASHTO PP 50 and validated according to AASHTO PP 51. At least 21 days before use, submit results showing the inertial profiler conforms to AASHTO PP 51. Furnish personnel to operate the inertial profiler according to AASHTO PP 52. Take Measurement in the middle portion of each lane. Submit test data to the Government.

Areas of localized roughness shall be identified using a 7.62-meter moving average filter. The difference between the 7.62-meter moving average and the reported relative elevation for every profile point will be determined. Deviations greater than 3.81 millimeters are areas of localized roughness.

An IRI value will be determined for each for each 0.1-lane kilometer of traveled way. Cattle guards and bridges not being overlayed shall be excluded from the calculation of IRI and determination of localized roughness. Measure excluded areas according to (c) below.

(b) Pavement roughness (IRI measurements for reconstructed and new roads). Measure the roughness of the final paved surface course. Defective areas are 0.1-kilometer segments with IRI values greater than 1.499 meters

per kilometer or areas of localized roughness. Defective areas shall be marked out by the Contractor's profilograph operator. All defective areas shall be corrected by in accordance with (d) below.

The pay adjustment factor for each 0.1-kilometer segment will be determined from Table 402-3.

Table 402-3
Type III Pavement Roughness

IRI (m/km)	Pay Adjustment Factor (PAF)
Less than 0.473	PAF = 7.00
0.473 to 0.946	PAF = 13.99 – 14.770 (IRI)
0.947 to 1.026	PAF = 0.00
1.027 to 1.499	PAF = 45.55 – 44.398 (IRI)
Greater than 1.499	Rejected (1)

(1) Pay adjustment factor when corrections are not allowed equals minus 21.00.

(c) Straightedge Measurement. Use a 3-meter (10-foot) metal straight edge to measure at right angles and parallel to the centerline. Defective areas are surface deviations in excess of 5 millimeters (1/4-inch) in 3 meters (10 feet) between any two contacts of the straightedge with the surface.

(d) Defective Area Correction. The Contractor's profiler subcontractor shall locate all the corrective areas using the data from the Contractor's profilograph. Correct defective areas from **(a)** and **(b)** above. Corrective action shall consist of one or more of the following as determined by the AOTR and Government engineers. **All corrective work shall be at no cost to the Government**:

1. Remove and replace the surface course.

2. Place an asphaltic concrete overlay course at least 2 times as thick as the maximum sized aggregate in the asphaltic mixture.

3. Grind the pavement surface with equipment that is diamond-tipped saw blades on a horizontal grinding head which cuts or grinds asphalt concrete leaving a corduroy surface behind. The type of equipment to be used shall be submitted in writing to the AO for approval. The thickness of the remaining pavement shall not be less than 9.5 mm less than the lift thickness. Cores may be required to verify the remaining thickness at no cost to the Government. The final pavement surface shall be uniform in appearance to the surrounding pavement. A fog seal or micro slurry seal may be required to protect the pavement surface; the AOTR and Government Engineers will make final determination.

Upon completion of corrective work, re-measure corrected areas according to **(a)** above. The new IRI obtained shall replace the original IRI. Submit the data to the AOTR.

402.17 Acceptance. See Table 402-3 for sampling and testing requirements and the acceptance quality characteristic category.

Mineral filler, antistrip additive, and recycling agent will be evaluated under Subsections 106.02 and 106.03.

Asphalt binder will be evaluated and accepted under Subsections 106.03(a), 106.04 (as amended) and 702.09 (as amended).

Construction of the Marshall designed hot asphalt concrete pavement course will be evaluated under Subsections 106.02 and 106.04 (as amended).

Asphalt content, aggregate gradation, density, and pavement smoothness will be evaluated under Subsection 106.05. Aggregate quality properties will be evaluated under Subsections 106.02 and 106.04.

(a) Asphalt content. The upper and lower specification limits are the approved job-mix formula target value plus or minus 0.4 percent.

(b) Aggregate gradation. The upper and lower specification limits are the approved job-mix formula target values plus or minus the allowable deviations shown in Table 703-4. See Table 402-3 for the acceptance quality characteristics category.

When hydrated lime is used in the approved job-mix formula, the final aggregate gradation shall include the lime. Cold-feed samples shall be taken at the hot plant for aggregate gradation. AASHTO T 27 is modified for cold-feed aggregate samples that contain lime. The cold-feed sample with lime shall not be oven dried. Immediately, the sample shall be split into two or three smaller test samples. Determine the initial wet mass of a split sample. Using a separate split sample, determine the moisture content. The dry mass (before sieve analysis testing) shall be determined by the following equation:

$$\text{Dry Mass} = \frac{\text{Wet Mass}}{[1 + (\%\ \text{Moisture})\ ] \times 100}$$

(c) Density. The lower specification limit is **92%** of the maximum specific gravity (density) determined according to AASHTO T 166 and AASHTO T 209 as part of the job-mix formula evaluation specified in Subsection 402.03.

The Government may elect to accept the pavement density by the use of a properly calibrated nuclear gauge in accordance with ASTM D2950. If this method is chosen by the Government, the Contractor shall be advised.

Using the cores, determine and report the pavement thickness in accordance with ASTM D 3549. Label and deliver the cores to the COR/AOTR after testing.

(d) Pavement smoothness/roughness. The evaluation will be made after all defective areas are corrected. See Subsection 402.16.

(e) Root-Tunnicliff tensile strength ratio test. The Root-Tunnicliff tensile strength ratio test will be evaluated under Subsection 106.04. See Table 402-3, of the contract supplemental specifications, for minimum sampling and testing requirements. The lower acceptance limit is **70%**.

(f) VMA. The lower specification limit is the value shown in Table 402-2.

(g) Marshall air voids, stability, and flow. The upper and lower specification limits for the air voids and flow are the values shown in Table 402-1. The lower specification limit for the stability is the value shown in Table 402-1.

(h) Sand equivalent. The lower specification limit is **55%**.

The hot asphaltic concrete pavement will not be accepted under any acceptance provisions of Subsection 106.02 to 106.05 if <u>any</u> of the following conditions exist:

1. The asphalt cement pay factor(s) are in the "No Pay or Remove Category" or;

2. The Root-Tunnicliff tensile strength ratio test does not meet the minimum acceptance limit of **70%** and the Marshall air voids, VMA, flow and stability do not meet the upper and/or lower specification limits as shown in Table 402-1 or;

3. Any of the pay factors for the asphalt content, gradation, density and pavement smoothness are less than 0.75; the materials shall be removed and rejected. Any asphalt binder, antistrip additive, and/or mineral filler in asphaltic concrete pavement, that has been rejected, shall also be subject to rejection regardless of whether the material meets specification or not.

4. Control strip(s) and/or any hot asphaltic concrete pavement placed that is rejected shall be removed immediately off the project site. Any asphalt cement, antistrip additive and/or mineral filler in the asphaltic concrete pavement mixture shall also be rejected regardless of whether the material meets specification or not.

Measurement

402.18 Measure the Section 402 items listed in the bid schedule according to Subsection 109.02. When the bid schedule does not contain a bid item for asphalt binder, antistrip additive, and/or mineral filler, then these items of work shall be considered incidental to item 40201.

Asphalt binder will be measured by the metric ton. Measurement shall be based on the Contractor's daily tank stab volume measurements at 15ºC (60ºF) or correct the volume used to 15ºC (60ºF) using recognized standard correction factors. Only asphalt binder used and accepted in the hot asphaltic concrete pavement mixture shall be measured for payment.

Hot asphaltic concrete pavement mixture used for repairing and patching any potholes or irregularities on the existing surface shall not be measured for payment but shall be considered a subsidiary obligation of the Contractor under this Section.

Payment

402.19 The accepted quantities will be paid at the contract price per unit of measurement for the Section 402 pay items listed in the bid schedule except the hot asphalt concrete pavement contract unit bid price will be adjusted according to Subsections 106.05 and 402.16. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Payment for hot asphalt concrete pavement will be made at a price determined by multiplying the contract unit bid price by the material pay factor. The material pay factor is the lowest single pay factor determined for asphalt content, specific gravity (density), or any individual sieve of the aggregate gradation.

A separate pay adjustment will be made for the pavement smoothness. The dollar amount of the adjustment will be determined by summing the pay adjustment factors determined in Subsection 402.16 for each 0.1-kilometer and multiplying that sum by the contract unit bid price.

Table 402-3
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Aggregate source quality	Measured and tested for conformance (106.04)	LA abrasion (coarse)	—	AASHTO T 96	1 per type & source of material	Source of Material	___	Before Producing
		Sodium sulfate soundness loss (coarse & fine)	—	AASHTO T 104	"	"	"	"
		Sand equivalent	—	AASHTO T 176, alternate method no. 2, reference method	"	"	"	"
Asphalt concrete (mix design)	Measured and tested for conformance (106.04)	Gradation	—	AASHTO T 27 & T 11	1 per submitted mix design	Stockpiles	___	28 days before producing
		Voids	—	AASHTO T 209	"	"	"	"
		TSR	—	ASTM D 48867	"	"	"	"
Aggregates (production)	Measured and tested for conformance (106.04)	Gradation	—	AASHTO T 27 & T 11	1 per 6 hours of production but not less than 2 per day	Flowing aggregate stream (bin or belt discharge) or off of conveyor belt	Yes, when requested	End of shift
		Sand equivalent	—	AASHTO T 176, alternate method no. 2, reference method,	1 per type & source of material	"	"	"
		Fractured faces	—	ASTM 5821	"	"	"	"
		Sample for job-mix formula verification	—	Subsection 401.03	1 per aggregate stockpile	"	—	21 days before approval of job-mix formula

Table 402-3 (continued)
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Asphalt binder	Measured and tested for conformance (106.04)	Quality	—	Subsection 702.01	1 per submitted source & mix design First 4 loads; every 25th load thereafter	In line between tank & mixing plant	—	14 cal. days after Sample date
Asphalt concrete mixture (all)	Measured and tested for conformance (106.04) & Section 105	Mix temperature	—	—	First load & every other load thereafter	Hauling vehicle before dumping or windrow before picking up	—	Upon completing test
Hot asphalt concrete pavement (control strip)	Statistical (106.05)	Gradation		AASHTO T 11, & T 27	3 minimum	Cold-feed belt at Hot Plant	Yes, when requested	4 hours
		TSR		ASTM D4867	Subsection 402.12 (b)	Behind paver before compacting	---	Upon completion
		Marshall properties		AASHTO T 245	Subsection 402.12 (b)	Ditto	---	Upon completion
		4.75 mm	I					
		2.36 mm	I					
		300 µm	I					
		75 µm	I					
		Other specified sieves	II					
		Asphalt content	I	AASHTO T 287	"	"	"	"

Table 402-3 (continued)
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Hot asphalt concrete pavement (control strip)	Statistical (106.05)	Core density[1]	I	AASHTO T 166 & T 209	At least 5 samples per control strip	In-place	Cores to COR/AOTR after determining specific gravity & compaction	—
Hot asphalt concrete pavement (production)	Statistical (106.05)	Gradation		AASHTO T 287, T 11, & T 27	1 per 700 t	Cold-feed belt at Hot Plant	Yes, when requested	4 hours
		TSR		ASTM D 4867	Subsection 402.03 (d)	Behind paver	"	Upon
		Marshall		AASHTO T 245	Subsection 402.03 (d)	"	"	completion
		properties						
		4.75 mm	I	"	"	"	"	"
		2.36 mm	I					
		300 µm	I	"	"	"	"	"
		75 µm	I					
		Other specified sieves	II	"	"	"	"	"
		Asphalt content	I	AASHTO T 287	"	"	"	
		Core density[1]	I	AASHTO T 166 & T 209	"	In-place	Cores to COR/AOTR after determining specific gravity	24 hours

Table 402-3 (continued)
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Hot asphalt concrete pavement (final surface)	Measured and tested for conformance (106.04)	Smoothness	—	See Subsection 402.16	See Subsection 402.16	See Subsection 402.16	—	14 days after final paving

(1) Cut core sample from the compacted pavement according to AASHTO T 230, method B. Fill and compact the sample holes with asphalt concrete mixture. Cores shall be 102 millimeters in diameter. Perform specific gravity and thickness tests on cores and deliver to COR/AOTR after testing is completed. Label cores and protect from damage due to handling or alteration due to temperature during storage or transfer.

SECTION 625 -TURF ESTABLISHMENT

625.02 Material.

Add the following:

The **WEED FREE** seed shall be delivered to the project site in standard, sealed, undamaged containers. Each container shall be labeled in accordance with the U.S. Department of Agriculture rules and regulations under the Federal Seed Act. Labels shall indicate the variety or strain of seed, the percentage of germination, purity and weed content, and the date of analysis which shall not be more than nine (9) months prior to the delivery date.

Seed shall consist of the type shown in section 625.07 below. Application rates of seed as specified are for Pure Live Seed (PLS). PLS is determined by multiplying the sum of the germination and hard or dormant seed by the purity.

625.03 Turf Establishment Season.

Add the following:

Seeding and mulching shall be performed immediately following final slope grading to the fullest extent possible. If seeding cannot be performed at final grading, then refer to section 157.04, subparagraph (H.2) for further requirements. In no case shall permanent non-dormant seeding and mulching be performed during the months of November 15 through March 15. Dormant seeding may take place during November 1st to December 15th.

625.04 Preparing Seedbed.

The second sentence of the first paragraph is superseded with the following:

Remove all weeds, sticks, high stone concentration areas with stones of 75mm in size or larger, and other debris detrimental to application, growth, or maintenance of the turf. If there is a substantial amount of rock/stone larger than 75mm in size that requires removal prior to seeding, then this additional work shall be compensable in accordance with section 109.02(m).

Add the following:

Seedbed preparation shall be accomplished with a disc harrow, chiseling tool or with other equipment, which will provide an even mixture of fertilizer into the soil.

Tillage will not be required on slopes of 2:1 or steeper. However, such slopes shall be fertilized, seeded and mulched as required. Tillage operation shall be performed so as to produce a soil surface that is rough, firm and free of clods.

Tillage shall be performed across the slope when practical. No work shall be done when the moisture content of the soil is unfavorable.

In areas, which, in the opinion of the AOTR, are too rocky to till without drastically disturbing the completed roadway sections, the AOTR will approve a reduction of tillage accordingly.

625.05 Watering.

This section is superseded with the following:

Watering is not required for the seeding on this project.

625.06 Fertilizing.

Add the following:

All areas to be seeded shall have ammonium phosphate, at a rate of 56 kg per Ha, uniformly applied to the surfaces to be seeded and tilled into a minimum of 76mm of the surface.

625.07 Seeding.

Add the following:

Seeding shall be accomplished by the Dry Method.

After the tillage is completed and accepted by the AOTR, seed shall be planted by drill, except that on slopes too steep or rocky, seed may be broadcast provided that it is covered by dragging, hand raking or other approved methods. The type of seed and pure live seed rate is as follows:

Species	Cultivar	Kg PLS per Hectares
Western Wheatgrass	Arriba	3.37
Crested Wheatgrass	Hycrest	3.37
Pubescent Wheatgrass	Luna	3.37
Indian Ricegrass	Paloma	2.25
Blanketflower	Red, Yellow	0.56
Red Mexican Hat	Red w/Yellow Tips	0.56
	Total:	13.48

Seed shall be planted approximately 6mm deep, with a maximum depth of 13mm. The distance between the drilled furrows shall not be more than 203mm. If the furrow openers on the drill exceed 203 mm, the area shall be drilled twice. Seeding shall be done with grass seeding equipment with double disc openers, depth bands, packer wheels or drag chains, rate control attachments, seed boxes with agitators and separate boxes for small seed.

Seed of different sizes shall be sowed from at least two separate boxes adjusted or set to provide the seeding rate specified above.

625.08 Mulching:

The first sentence is superseded with the following:

Apply **WEED FREE** straw mulch at a rate of 4500kg/Ha after seeding by the following methods:

625.11 Method of Measurement.

The first sentence is superseded with the following:

Measure the seeding by the hectare, on the ground surface, or by the slurry. Fertilizer and mulching shall not be measured for payment but shall be considered a subsidiary obligation of the Contractor covered under the work for this section.

Bid Item	Description	Units
62510-1000	Seeding, dry method	Hectare

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SECTION 633. - PERMANENT TRAFFIC CONTROL

633.01 Description.

The second paragraph is superseded with the following:

All permanent traffic control signs shall be fabricated out of aluminum only.

633.03 General.

Add the following:

Any existing signs which require removal (prior to the installation of the permanent signs) due to construction activity shall be temporarily reset as directed by the AOTR. The Contractor shall notify the AOTR three (3) working days prior to sign removal. This work shall be incidental to the construction bid item to which the sign removal was required.

633. 06 Delineators and Object Markers.

Add the following:

Delineator posts and all Type II object markers shall be flexible type fabricated out of reinforced fiber glass, and able to withstand repeated vehicular impact and provide resistance to ultraviolet light. The posts shall be as shown on the design plans. Type II object markers and signs shall be fabricated in accordance with the manufacturers specifications.

Type III object markers shall be mounted on 2.98kg/m steel posts with the marker fabricated out of aluminum.

633.09 Measurement.

Add the following:

The Type 1a & 1b delineators, Type II, and Type III object markers and posts shall be measured as a sign system, respectively.

The milepost markers shall be measured as a sign system.

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Section 634.- PERMANENT PAVEMENT MARKINGS

634.01 Description.

Add the following:

The Contractor shall provide temporary traffic control in accordance with Section 635.- Temporary Traffic Control and the approved traffic control plan.

634.03 General.

Add the following:

Permanent pavement markings **shall begin no earlier than 5 days and no later than (2) weeks <u>after completion</u>** of the asphalt pavement, fog seal, and/or chipseal work unless otherwise agreed to by the AOTR in writing. If the Contractor fails to comply with the above, the AO will withhold all pending and future progress payments under this contract until the Contractor complies with this requirement.

The third paragraph is superseded with the following:

At least **7 days** before applying pavement markings, furnish a written copy of the markings manufacturer's recommendations for use. A field demonstration shall be conducted **before** the Contractor is authorized to place permanent pavement markings to verify the adequacy of the manufacturer's recommendations, equipment compliance, application rates of the traffic markings and beads. The field demonstration shall be 30 meter for the white traffic markings with glass beads and 60 meter for the yellow markings with glass beads meeting the contract requirements under this section. Cease demonstration after placement of pavement markings until the demonstration is evaluated and accepted (PROPER MIL THICKNESS IS CRITICAL).

The field demonstration is accepted if the manufacturer's recommendations are verified and the application rates of the traffic markings and glass beads are within the contract specification limits. Remove unaccepted markings by fine sand or ground nutshell blasting or other approved methods at the entire expense of the Contractor.

Repeat the field demonstration until an acceptable demonstration is produced. See Subsection 106.01 for the disposition of material in unacceptable demonstration(s). All markings placed on the project limits which do not meet the requirements of this Subsection as determined by the Engineer, shall be removed by the contractor at no additional cost to the Government. Any damage to the pavement caused by the demonstration pavement marking removal shall be repaired by methods acceptable to the Engineer. Accepted field demonstrations shall remain in place and will be accepted and measured as a part of the completed work. When a field demonstration is accepted, full production may begin.

If the Contractor changes manufacturer or if the marking operation is producing unsatisfactory results, the field demonstration procedures shall be repeated as necessary until the desired results are achieved.

The Contractor shall ensure that all paint and other markings sampling and handling procedures are performed in accordance with the following where applicable:

1. Drums of markings shall have tamper proof seals as required under Subparagraph **634.03(b) Drum Seals**;

2. The markings and bead tanks on the striping machine shall be empty, unless the Contractor provides a *Letter of Transfer for Markings* from a previous BIA /State project as required under Subparagraph **634.03(f) Letter of Transfer for Markings**;

3. Settled pigment shall be re-disbursed before loading markings as required under Subparagraph **634.03(a) Re-disbursement of Settled Markings**;

4. The Contractor shall strap the tanks as described in Subparagraph **634.03(e) Volume Control Requirements**.

Add the following subparagraphs:

(a) Re-disbursement of Settled Markings. When markings have settled excessively, the Contractor shall re-disburse the settled pigments at the bottom of the markings drums with a mixing device before pumping or loading into the striping unit so that excess pigments are not left on the bottom of the markings drums. Thinner shall not be allowed to be pumped into the markings tanks.

(b) Drum Seals. Drums of markings used on Government projects shall be sealed at the point of manufacture and consecutively numbered with tamper proof seals. These seals shall only be removed with the AOTR present at the time of actual use. Drums with broken seals shall not be accepted.

(c) Equipment. The traffic markings and beads shall be placed on the pavement by a spray type, self propelled pavement marking machine, except that temporary striping during construction may be placed with other equipment designed for application of markings, or beads.

The machine shall be capable of applying clear-cut 102mm lines. The machine shall be equipped with an air-operated glass bead drop-in dispenser controlled by the spray gun mechanism. The machine shall be equipped with a mechanical device capable of placing a broken reflectorized centerline stripe having a 3.0 meter length and 9 meter gap between stripes.

The dispenser shall be capable of placing the glass spheres immediately into the markings line as it is applied to the pavement in such a manner as to provide satisfactory marking and delineation.

(d) Measurement Devices. A method of measuring the actual volume of markings and beads in the tanks shall be provided on the tanks either by strap measurement or other externally approved gaging methods.

The Contractor shall provide current certification of calibration of all marking equipment at least 7 calendar days before the field demonstration for review and approval.

(e) Volume Control Requirements. The volume of markings and glass beads in place shall be measured by the quantity per kilometer method or by the use of markings and beads gauges.

The Contractor shall strap the tanks before beginning striping operations and again after **1 kilometer** has been striped or if the striping machine is equipped with air atomized spray units (not airless) and markings and bead gauges, the volume may be determined by said gauges.

The volume shall be measured again at the beginning and end of each day. This information shall be given to the AOTR.

(f) Letter of Transfer for Markings. The markings and bead tanks of the striper must be **empty** before filling for the beginning of the striping operations for the project, unless a *Letter of Transfer for Markings* has been obtained.

Paint markings or glass beads left over in the striping truck tank can be transferred from one BIA project by providing a *Letter of Transfer for Markings* which shall include the following information:

1. The quantity left in the tanks;

2. The BIA project it is coming from, including the termini and project name;

3. The project it is going to;

4. The date;

5. The batch number the markings came from;

6. The seal numbers of the markings in the tank;

7. The previous AOTR's signature.

(g) Tolerance Requirements for Placing Markings & Beads. The finished lines shall be smooth, aesthetically acceptable and free from undue waviness. The finished marking material shall be rectangular in shape with well defined edges.

(h) Repair & Replacement of Unacceptable or Damaged Striping. If the markings are not adhering to the existing pavement, the Contractor shall **REMOVE** the striping (under an approved method) and shall **RESTRIPE** the existing pavement. All damage to the pavement markings because of the Contractor's negligence or failure to maintain traffic control shall be **repaired at no additional cost to the Government**.

634.08 Thermoplastic Markings (Type H and I).

Add the following:

When thermoplastic paint is applied to concrete surfaces, the concrete surface shall be primed and sealed in accordance with the paint manufactures recommendations prior to application of the paint. A copy of the primer and sealer material specifications shall be provided to the AOTR for review and approval prior to application.

634.13 Measurement.

This subsection is superseded with the following:

Measure the Section 634 items listed in the bid schedule according to Subsection 109.02 and the following.

The pavement markings shall be measured by the meter. The number of meters of lines applied will be measured along the centerline of each 102mm wide line applied regardless of color. Broken or dotted pavement lines will be measured from end to end of the line including gaps. Solid pavement lines will be measured from end to end of each continuous line. For line widths other than 102mm, the measured length of line is adjusted in the ratio of the required width to 102mm.

SECTION 635 - TEMPORARY TRAFFIC AONTROL

635.03 General.

Add the following:

The construction plans will show Temporary Traffic Control Details of general requirements. After award of contract, the Contractor shall be required to develop his Traffic Control Plan (TCP) in accordance with the details shown in the design plans and the *Manual on Uniform Traffic Control Devices for Streets and Highways*, latest edition, and amendments.

The Contractor shall submit (at least 21 calendar days prior to the **Notice to Proceed**) his TCP in full professionally developed details using the Government's traffic control details as a guide, to the AOTR and NRDOT Division Manager for review. Neat hand drawn sketches will be accepted for emergency addendums to the original TCP ONLY with written justification. The Contractor assumes full responsibility and expense for errors and/or omissions in the TCP regardless of whether the plan was reviewed by the Government before the errors and/or omissions were discovered or after. The Contractor is also responsible for insuring a TCP that meets the contract requirements is in hand before construction begins. Failure to insure the TCP meets the contract requirements may result in a "Stop Work" order to be filed with the Contractor.

The NRDOT Division Manager will review and return the TCP within 14 calendar days, after receipt of the new TCP from the Contractor, stating either "Accepted", "Accepted as Noted", or "Resubmit".

Once the NRDOT Division Manager has notified the Contractor that the TCP has been accepted for use on the project, it will be the responsibility of the Contractor to implement and maintain the TCP prior to construction so as to accommodate traffic safely. The TCP shall be in force at all times during construction and at all locations where construction equipment is being used within the roadway prism. This shall include the area 457 meters (1500 feet) preceding the beginning of project and 457 meters (1500 feet) beyond the end of project.

Should the Contractor elect to perform other minor shoulder or corrective work outside the zone of the accepted TCP, or at various other work zones, it will be the Contractor's responsibility to provide additional traffic control (warning signs, barrels, barricades, flaggers, etc.) to direct traffic in a safe manner in accordance with the MUTCD manual as directed by the AOTR. Any additional traffic control required shall be considered incidental to completion of project and no additional payment shall be made.

The latest edition of the MUTCD manual is incorporated by reference into the Contractor's TCP. In cases of inconsistencies between the Contractor's TCP and what the MUTCD manual requires, the provisions of the MUTCD shall govern.

The Bureau of Indian Affairs (BIA) Safety Manager and/or the Contracting Officer's Representative will make periodic inspections of the project and report to the Contracting Officer regarding the Contractor's compliance with his TCP.

Failure by the Contractor to comply with his TCP, or perform work which could be dangerous to the safety of the traveling public (without proper traffic control devices) shall be just cause for the

Contracting Officer to issue a "Stop Order" per section 108.05 for immediate corrective action to be taken.

When the Contractor has taken satisfactory corrective action, a written order to resume work shall be issued as required. The Contractor shall not be entitled to any extension of contract time; any claims for damages or to any excess cost by reason of the stop order and/or suspension orders. Failure of the Contracting officer to order suspension of any or all work in progress shall not relieve the Contractor of his responsibilities or obligations defined herein.

Flagging, signing, and any other traffic control required on haul routes from material pits and all detour roads shall not be measured for payment, but shall be considered a subsidiary obligation of the Contractor where the cost shall be included in the appropriate bid items.

Add the following subparagraphs:

(j) Any existing side routes (i.e. roads outside the project r/w) used as detours for road and drainage structure construction shall be properly signed and maintained (in a safe manner) at least twice per week in accordance with sections 212, 107 and 156. These existing side routes proposed for use as detour roads shall not be modified without the Contractor first obtaining proper permits to do so. The use and maintenance of these side routes shall be included in the unit price bid for item 63501-0000.

(k) Any proposed detour roads (within the project r/w) as shown on the contractor's TCP shall be constructed, maintained, and signed in accordance with sections 212, 107.01, and 156. It shall be the responsibility of the contractor to adequately design and install any and all drainage structures for such detour roads that cross existing washes including obtaining all necessary permits. All proposed temporary drainage structures shall be shown on the contractor's TCP and ECP. The construction, maintenance, and subsequent removal and restoration work of proposed detour roads shall be included in the unit price bid for item 63501-0000.

635.07.1 Construction Signs:

Add the following:

All sign sheeting shall have a reflectivity in accordance with section 718.01 as modified in these supplemental specifications.

635.09 Flaggers.

Add the following:

Copies of the Flaggers certifications must be current (in accordance with the certification program criteria) and provided to the AOTR for review and acceptance at the time the NTP is given. Flaggers that have **current** certification from other federally approved flagger certification programs (i.e. states, counties, and tribal safety programs) may be allowed provided the Contractor submits documentation that the program is recognized and approved by either the FHWA, TRB, or ATSSA. Flaggers with training certificates are **not allowed**.

635.25 Acceptance.

Add the following:

Any damaged traffic control devices used on the project that is considered ineffective for its intended use (by the AOTR) shall be replaced at the Contractor's expense. Should the Contractor neglect or refuse to replace any traffic control device that the AOTR considers damaged to the extent that it no longer serves as an effective traffic control device (through a "noncompliance work order"), then the AO shall issue a "stop work order" in accordance with section 108.05 until the Contractor has complied with the AO/AOTR directive.

635.26 Measurement.

The sixth paragraph is superseded with the following:

Measure flaggers by the Man-Hours for each hour the flagger(s) are actually performing flagging work within the project limits. Round portions of an hour up to the half hour for pay estimates. Flagger hours in excess of 40 hours in a week will not be measured for payment unless approved by the AOTR. Hours of flaggers attending meetings not related to traffic safety, or attending to placement or removal of traffic control devices shall not be measured for payment.

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Section 703.- AGGREGATE

703.05 Subbase, Base, and Surface Course Aggregate.

(b) Subbase or base aggregate.

(1) Gradation Table 703-2

Table 703-2 is superseded with the following:

Table 703-2
Aggregate Base Gradation

Sieve Size	Percent by Mass Passing Designated Sieve, AASHTO T 27 & T11
37.5mm (1½-inch)	100
25mm (1-inch)	80 – 100
19mm (3/4-inch)	65 – 80
9.5mm (3/8-inch)	40 – 65
4.75mm (No.4)	30 – 50
425µm (No.40)	8 – 30
75µm (No.200)	2 – 12

(c) Surface course aggregate.

The statistical procedures and allowable deviations do not apply.

703.07 Hot Asphalt Concrete Pavement Aggregate.

(a) Coarse aggregate (retained on a 4.75-millimeter sieve).
Add:

(5) Adherent coating on the aggregate,
FLH T 512 0.5% maximum

(6) Percent Carbonates in Aggregate,
Arizona Test Method ARIZ 238a Maximum 75%

The last paragraph is deleted.

703.10 Asphalt Surface Treatment Aggregate.

Add:

(i) Density, AASHTO T 19MMin. 1100 kg/m³ (70 lbs./ft³)

(j) Coating and stripping of bitumen-aggregate
Mixtures, AASHTO T 182Min. 95%

Table 703-7 is superseded with the following:

Table 703-7
Target Value Ranges for
Single and Multiple Course Surface Treatment Aggregate Gradation

Sieve Size	Percent by Mass Designated Sieve (AASHTO T 27 & T 11)
	Grading Designation – Special
12.5mm (1/2-inch)	100 **(1)**
9.5mm (3/8-inch)	70-85 (3)
6.3mm (1/4-inch)	0-15 (5)
4.75mm (No.4)	0-5 (3)
2.36mm (No.8)	0-2 (1)
75µm (No.200)	0-1 (1)

(1) Statistical procedures do not apply.
( ) The value in the parentheses is the allowable deviation (±) from the target values.

703.13 Blotter.

This subsection is superseded with the following:

Furnish sound durable particles of sand, gravel or crushed stone conforming to the following:

Table 703-13
Blotter Material Gradation

Sieve Size	Percent Passing by Weight, AASHTO T 27 & T 11
9.5mm (3/8-inch)	100
1.18mm (No.16)	40 – 80
75µm (No.200)	0 – 10

(a) Plastic limit, AASHTO T90 Non-plastic

(b) Free of organic matter and clay balls.

PERCENT CARBONATES IN AGGREGATE
(An Arizona Method)

SCOPE:

1. (a) This test method describes the procedure for determining the percentage of carbonates in aggregate. A combination of hydrogen peroxide and nitric acid is used to react with the carbonates.

   (b) This test method involves hazardous material, operations, and equipment. This test method does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

   (c) Metric (SI) units and values are shown in this test method with English units and values following in parentheses. Values given for metric and English units may be numerically equivalent (soft converted) for the associated units, or they may be given as rounded or rationalized values (hard converted). Either the metric or English units along with their corresponding values shall be used in accordance with the applicable specifications. See Appendix A2 of the Arizona Materials Testing Manual for additional information on the metric system.

   (d) See Appendix A1 of the Arizona Materials Testing Manual for information regarding the procedure to be used for rounding numbers to the required degree of accuracy.

APPARATUS AND MATERIALS:

2. Requirements for the frequency of equipment calibration and verification are found in Appendix A3 of the Arizona Materials Testing Manual. Apparatus and materials for this test procedure shall consist of the following:

   (a) Drying apparatus--Any suitable device capable of drying samples at a temperature of 110ºC plus or minus 5ºC (230ºF plus or minus 9ºF).

   (b) 100 mL heavy duty beaker.

   (c) Hydrogen Peroxide (3% solution) - H_2O_2.

   (d) Nitric Acid (concentrated)--HNO_3.

   (e) Distilled water.

   (f) A balance or scale capable of measuring the maximum weight to be determined and conforming to the requirements of AASHTO M 231, except the readability and sensitivity of any balance or scale utilized shall be at least 0.1 gram.
   (g) Neutral Litmus Paper.

(h) Glass or Plastic Stirring Rod.

SAMPLE PREPARATION:

3. Prepare the sample according to the following:

(a) For material samples from stockpile(s), obtain a representative 300 gram plus or minus 10 gram sample of plus 4.75 mm (No.4) material. Wash the sample over a 4.75 mm (No.4) sieve and discard minus 4.75 mm (No.4) material.

(b) For uncrushed material samples, obtain a representative sample and crush to appropriate grading. Obtain a representative 300 gram plus or minus 10 gram sample of plus 4.75 mm (No.4) material.

(c) The prepared sample shall be oven dried to constant weight at 110ºC plus or minus 5ºC (230ºF plus or minus 9ºF).

TEST PROCEDURE:

4. (a) Allow sample to cool and place in a tared 1000 mL beaker. Weigh and record the weight of aggregate as the "weight of original sample" or "A" to the nearest 0.1 gram.

(b) Under a fume hood, add approximately 300 mL of H_2O_2 (3% solution) and stir. When the bubbling subsides, begin adding small amounts (approximately 10 mL) of concentrated HNO_3 to the beaker. Bubbling will be vigorous as the carbonates are being dissolved. Stir occasionally.

(c) When the bubbling has ceased and addition of HNO_3 causes no more bubbles, begin to wash by decantation, using distilled water. Care shall be taken not to lose any of the coarse aggregate. Wash by decantation at least 4 times. At this point, neutral litmus paper in the water should show only slight pink.

(d) Decant the water and oven dry to constant weight at 110ºC plus or minus 5ºC (230ºF plus or minus 9ºF).

(e) Let cool, weigh, and record the weight of aggregate as the "weight of non-reactive aggregate" or "B" to the nearest 0.1 gram.

CALCULATIONS:

5. (a) Calculate the percent of carbonates as follows:

$$\text{Percent of Carbonates} = \frac{A-B}{A} \times 100$$

Where: A = weight of original sample

B = weight of non-reactive aggregate

(b) Report the percent of carbonates to the nearest 1%.

704.02 Bedding Material.

Add the following subparagraph:

(c) Resistivity, AASHTO T 288	≥2000 ohm-cm, Min.
(d) pH, AASHTO T289	≥ 6.0

Volcanic ash type material for bedding shall not be used.

704.03 Backfill Material.

(a) For all structures and pipes other than plastic pipes.

Add the following to this subparagraph:

(c) Resistivity, AASHTO T 288	≥2000 ohm-cm, Min.
(d) pH, AASHTO T289	≥ 6.0

Volcanic ash type material for backfill shall not be used.

704.06 Unclassified Borrow.

This subsection is superseded with the following:

Furnish granular material free of excess moisture, muck, frozen lumps, roots, sod, or other deleterious material. Material composed of lava or volcanic cinder is disallowed as borrow material. Material shall conform to the following:

(a) Maximum dimension	600 mm
(b) Soil classification, AASHTO M 145	A-1, A-3, or A-2-4

If unclassified borrow is used as bedding and/or backfill material under Section 209, the material shall also conform to 704.02 and 704.03.

SECTION 710 - FENCE AND GUARDRAILS

710.01 Barbed Wire:

Add the following:

Stays for barbed wire fences shall conform to the requirements of ASTM A 641, and shall have a coated diameter of at least 0.142 inch (3.6 mm), shall be class 1, and soft temper.

Tie wire, wire fasteners or wire clips for fastening barbed wire to steel posts shall have a coated diameter of 0.120 inch (3.0 mm) or greater and shall be Class 1, soft temper, and meet the requirements of ASTM A 641.

All woven wire shall conform to the requirements of AASHTO M 279 Design 832-6-14 $^{1}/_{2}$, grade 125.

710.04 Fence Posts and Bollards.

Add the following to subsection (c):

(1) Powder Coated post will be evaluated under Subsection 106.03. Furnish a commercial certification including the name of the manufacturer, product name, style number, chemical composition, and other pertinent information to fully describe the product.
   a) Hardness ASTM D3363 Min 2H
   b) Adhesion ASTM D3359 5B
   c) Impact Resistance ASTM D2794
   d) Direct Impact ASTM D2794

SECTION 718. - TRAFFIC SIGNING AND MARKING MATERIAL

718.01 Retroreflective Sheeting.

Add the following:

Retroreflective sheeting materials proposed shall be Type II or better per Table 718-3 below, with certifications, for all signs shall be submitted for review and approval prior to ordering the materials.

718.03 This Subsection is deleted in it's entirety.

718.04 This Subsection is deleted in it's entirety.

718.08 Signposts. Furnish wood, steel, or aluminum signposts as specified.

Subsection (b) is superseded with the following:

(b) Steel posts. Furnish posts that are straight, smooth, and free from defects affecting strength, durability, or appearance. Conform to the following:

(1) U-channel steel posts. Furnish flanged, channel, galvanized steel posts conforming to ASTM A 499, grade 60, and the following:

(a) Dimensions of U cross-section

(1) Width of opened end of U 75 – 90 mm including flanges
(2) Width of closed end of U 25 – 40 mm
(3) Depth of U 25 – 50 mm
(4) Thickness of steel 3 – 5 mm

(b) Punching shall be performed prior to coating. Starting 25 millimeters from the top and extending the full length of the post, drill or punch 10-millimeter holes on 25-millimeter centers along the centerline of the bottom of the U. Remove all burrs and sharp edges.

(c) Coating

(1)Galvanized coated post according to AASHTO M 111M
(2) Powder Coat will be evaluated under Subsection 106.03. Furnish a commercial certification including the name of the manufacturer, product name, style number, chemical composition, and other pertinent information to fully describe the product.

a) Hardness ASTM D3363 Min 2H
b) Adhesion ASTM D3359 5B

c) Impact Resistance ASTM D2794
d) Direct Impact ASTM D2794

(2) Square tubular steel posts. Furnish square tubular galvanized steel posts conforming to ASTM A 1011M, grade 55, or ASTM A 715, grade 60, and the following:

(a) Dimensions
(1) Outside dimensions 44.5 mm by 44.5 mm or 50.8 mm by 50.8 mm
(2) Wall thickness 2.1 mm
(3) Mass 2.5 – 3.0 kg/m

(b) Punching. Starting 25 millimeters from the top and extending the full length of the post, drill or punch 11-millimeter holes on 25-millimeter centers along the centerline of all four sides, in true alignment and opposite each other directly and diagonally. Remove all burrs and sharp edges.

(c) Coating:

1) Galvanizing after punching ASTM A 635M, (inside and outside of post) coating Z275designation.

2) Powder Coat after punching. Powder Coat will be evaluated under Subsection 106.03. Furnish a commercial certification including the name of the manufacturer, product name, style number, chemical composition, and other pertinent information to fully describe the product.
a) Hardness ASTM D3363 Min 2H
b) Adhesion ASTM D3359 5B
c) Impact Resistance ASTM D2794
d) Direct Impact ASTM D2794

718.11 Letters, Numerals, Arrows, Symbols, and Borders.

Add the following:

The letters, numerals, arrows, symbols, borders, etc. shall be applied in accordance with subsection 718.11 (b) Type L-3 (Direct Applied Characters) having a Class 2 adhesive, and as shown on the design plans.

Table 718-3

Sign Color	Sheeting Type (ASTM D 4956)[1]				Additional Criteria
	Beaded Sheeting			Prismatic Sheeting	
	I	II	III	III, IV, VI, VII, VIII, IX, X	
White on Green	W*; G≥7	W*; G≥15	W*; G≥25	W≥250;G≥25	Overhead
	W*; G≥7	W≥120;G≥15			Ground Mounted
Black on Yellow or Black on Orange	Y*;O*	Y≥50;O≥50			2
	Y*;O*	Y≥75;O≥75			3
White on Red	W≥35;R≥7				4
Black on White	W≥50				

1) The minimum maintained retroreflectivity leverls shown in this table are in units of cd/lx/m² measured at an observation angle of 0.2° and an entrance angle of -4.0°

2) For test and fine symbol signs measuring at least 1200 mm (48 in) and for all sizes of bold symbol signs

3) For test and fine symbol signs measuring less than 1200 mm (48 in)

4) Minimum Sign Contrast Ratio ≥ 3:1 (white retorreflectivity ÷red retroreflectivity)

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