SPECIAL NOTICE TO BIDDERS

The Department hereby notifies bidders that information to assist in bid preparation is available from the Department of Transportation and Public Facilities, Anchorage office, located at 4111 Aviation Avenue.

1. Publications. The following are available from the Plans Room, download online, or as noted:

   a. Standard Specifications for Highway Construction, 2020 Edition comb bound ($25.00), download at: www.dot.state.ak.us/stwddes/dcsspecs/assets/pdf/hwyspecs/sshc2020.pdf, or order bound book from LuLu at: http://www.lulu.com/shop/search.ep?keyWords=Alaska+Specification&sorter=relevance-desc
   b. Alaska Test Methods Manual (Lab & Field), July 15, 2018 Edition ($25.00). Available online at: www.dot.state.ak.us/stwddes/desmaterials/mat_waqtc/testman.shtml
   c. Alaska Storm Water Pollution Prevention Plan Guide, March 2017. www.dot.state.ak.us/stwddes/desenviron/resources/stormwater.shtml
   e. Quantity Computations
   f. Cross Sections
   g. Geotechnical Report, 1g. Project Name ____, Project No. __, Month _, Year ___. By _____(Company/Agency/Dept. etc.).
   I. Erosion, Sediment Control Plan (ESCP). 1i. Project Name _____, Project No. _____, Month _____, Year ___.
   j. Traffic Control Plan (TCP). 1j. Project Name _____, Project No. _____, Month _____, Year ___. Place TCPs, not Professionally sealed, in the plans room. Seal TCPs per Preconstruction Manual 1400.3.5, Jan 30, 2012, coordinate with the PM.

2. Materials Certification List (MCL). The MCL provides the Engineer with the appropriate approving authority. Contractor, submit certification for each material to the Engineer. The MCL is included in Appendix C.

3. Environmental Documents. The Department has approved an environmental document addressing concerns and environmental commitments. This document is available for review in the Department Section of Preliminary Design and Environmental. (907) 269-0542.

4. Section 120, Disadvantaged Business Enterprise (DBE) Program. The Department, in coordination with US DOT, has adopted a Race-Neutral DBE Program effective for Federal-aid projects advertised in Central Region after June 30, 2015. In particular, all bidders shall be aware that Good Faith Effort Documentation is required from the successful bidder for all contracts, regardless of DBE goal or DBE utilization, in accordance with Section 120 Disadvantaged Business Enterprise (DBE) Program.

   The overall DBE Utilization Goal is revised to 8.83 percent.

   Direct questions about this notice to the Manager of the Civil Rights Office, (907) 269-0848, http://www.dot.state.ak.us/cvlrts/index.shtml.

5. Cargo Preference Act Requirements. The provisions of the Cargo Preference Act (CPA) must be physically incorporated into all Federal-aid Projects awarded after February 15, 2016, and must be physically incorporated in all agreements with subcontractors and lower tier subcontractors.

   Form 25D-55 (2/16) is revised to include the CPA provisions to the Required Contract Provisions for Federal-Aid Construction Contracts. See the last page of Form 25D-55 for the CPA requirements.

   For additional details, please visit: https://www.fhwa.dot.gov/construction/cqit/cargo.cfm

6. Buy America Act. On December 22, 2015, U.S. District Court for the District of Columbia issued a decision vacating the Federal Highway Administration (FHWA) 90 percent threshold exemption for manufactured steel and iron products and the miscellaneous steel or iron components, subcomponents and hardware waiver. As a result of the federal court decision, FHWA withdrew their December 21, 2012 policy memorandum clarifying provisions of the Buy America Act requirements.

7. COVID-19 Management Plan. In cooperation with the Associated General Contractors of Alaska, DOTPF has developed a COVID-19 Management Plan that has been approved by the Alaska Department of Commerce, Community, and Economic Development for utilization by DOTPF contractors and consultants in compliance with requirements of Health Mandates 10 and 12. A copy of this plan may be downloaded at:

   http://dot.alaska.gov/stwddes/dcsconst/assets/pdf/covid_response_master.pdf.

   To comply with the Health Mandates, all DOTPF contractors, subcontractors, and consultants must either adopt the pre-approved COVID-19 Management Plan or develop their own approved plan.

   Consistent with Section 107-1.01 of the Standard Specifications for Highway Construction, the Contractor will be responsible for paying all costs and expenses incurred to comply with all COVID-19 Health Mandates in effect during times when the Contractor is performing project-related work activities. The Contractor will additionally be responsible for preparing all general or site-specific mitigation and response plans required for its forces, along with any attendant schedule delays or impacts. To the extent mitigation and response plans are required by a Health Mandate, those will be provided to the Engineer seven (7) days prior to mobilization.

8. Laborers Mechanics Minimum Rate of Pay. The current Laborers Mechanics Minimum Rate of Pay contains information on remote sites and per diem. The Department of Labor has issued WHPL #197, which further clarifies this requirement. See pay item 640(4).

9. Asphalt Material Price Adjustment. The unit price adjustment for asphalt material will be combined and paid under one Pay Item. Refer to Sections in Division 300 and 400 that include an "Asphalt Material Price Adjustment" Pay Item.

10. Solicitation Cancellation.

11. Limitation of Operation. Limit disturbed unstabilized ground. Refer to Subsection 652-1.04 Limitation of Operation for further information.

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PART 4

STANDARD MODIFICATIONS AND SPECIAL PROVISIONS

To the **STATE OF ALASKA**

STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION

2020
EDITION

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SECTION 104
SCOPE OF WORK

Special Provisions

104-1.06 VALUE ENGINEERING CHANGE PROPOSALS BY CONTRACTOR.

Replace 104-1.06.3.e with the following:

e. The Contractor may submit VECPs for an approved subcontractor. If the Contractor elects to submit a VECP for an approved subcontractor and it is subsequently accepted by the Department, the Department will reimburse the Contractor per 104-1.06.5.

CR104.2-040120

SECTION 105
CONTROL OF WORK

Special Provisions

Add the following Subsection 105-1.011 Related Sections:

105-1.011 RELATED SECTIONS.

Section 651, Control of Work – Supplemental Requirements

CR105.5-012816

SECTION 107
LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Special Provisions

107-1.02 PERMITS, LICENSES, AND TAXES.

3. Fill in the permits as received by the Department. If no permits remove CR107.4, "The Department will: Add No. 3:"

The Department will: Add No. 3:

Where ARRC draft permit is required, include it in an appendix. Add information below similar to other permits. The ARRC permit includes their specification; do not include a DOT specification.

3. The Department has received the following permits on the Contractor's behalf:

a.
b.

CR107.4-120117R

The Contractor shall: Add No. 10:

10. Provide a wetland specialist able to conduct wetlands determinations and delineations according to the Corps of Engineers 1987 Wetland Delineation Manual, and the Regional Supplement to the Corps of Engineers Wetland Delineations Manual (Alaska Region, Version 2.0, September 2007). The wetland specialist shall conduct the determination and delineations of sites outside the project limits or not previously permitted, impacted by the Contractor's operations. These delineations will be subject to Corps of Engineers approval.

CR107.5-120117R

107-1.07 ARCHAEOLOGICAL OR HISTORICAL DISCOVERIES. Replace the 1st sentence including numbers 1, 2, and 3, with:

When operation encounters historic or prehistoric artifacts, burials, remains of dwelling sites, paleontological remains, (shell heaps, land or sea mammal bones or tusks, or other items of historical significance), cease operations immediately and notify the Engineer.

107-1.11 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE. Add the following:

Non-municipal Water Source. If water is required for a construction purpose from a nonmunicipal water source, obtain a Temporary Water Use Permit from the Water Resource Manager, and provide a copy to the Engineer. The Water Resource Manager is with the Department of Natural Resources in Anchorage and may be contacted at (907) 269-8645.

CR107.3-051517

Add the following:

Eagles. Eagles are protected under 16 U.S.C. 668-668c Protection of Bald and Golden Eagles, that prohibits “takes” of eagles, their eggs, nests, or any part of the bird. The Act defines “taking” as “to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.”

Maintain a Primary Zone of minimum 330-feet as an undisturbed habitat buffer around nesting eagles. If topography or vegetation does not provide an adequate screen or separation, extend the buffer to 1320-feet, or a sufficient distance to screen the nest from human activities. The actual distance will depend on site conditions and the individual eagle’s tolerance for human activity. Within the Secondary Zone, between 330-feet and 660-feet from a nest tree, no obtrusive facilities, or major habitat modifications shall occur. If nesting occurs in sparse stands of trees, treeless areas, or where activities would occur within line-of-site of the nest, extend the buffer up to 2640-feet. No blasting, logging and other noisy, disturbing activities should occur during the nesting period (February 1 – August 31) within the primary or secondary zones.

Do not disturb a nesting eagle. Notify the Engineer when an active eagle nest is within the primary or secondary zones.

CR107.1-100118

SECTION 108
PROSECUTION AND PROGRESS

Special Provisions

Add the following Subsection 108-1.011 Related Sections:

108-1.011 RELATED SECTIONS.

Section 652, Prosecution and Progress – Supplemental Requirements

CR108.3-012816R

Standard Modification

108-1.07 FAILURE TO COMPLETE ON TIME. Replace Table 108-1 with the following:

TABLE 108-1
DAILY CHARGE FOR LIQUIDATED DAMAGES
FOR EACH CALENDAR DAY OF DELAY

Original Contract Amount		Daily Charge
From More Than	To and Including	
$ 0	500,000	$1,000
500,000	1,000,000	1,500
1,000,000	5,000,000	1,800
5,000,000	10,000,000	2,500
10,000,000	25,000,000	3,800
25,000,000	---------	4,800

CR_HSM20-1-041420

SECTION 109
MEASUREMENT AND PAYMENT

Special Provision

109-1.01 GENERAL. Replace the 2nd paragraph with the following: When more than one type of material or work is specified for a pay item, the proposal line number, and the description are used to differentiate the material or work.

CR109.4-010120

109-1.05 COMPENSATION FOR EXTRA WORK ON TIME AND MATERIALS BASIS. Under Item 3. Equipment, Item a. add the following to the second paragraph:

The rental rate area adjustment factors for this project shall be as specified on the adjustment maps for the Alaska – South Region.

Provide a printed copy of the current EquipmentWatch rate sheet for each piece of equipment utilized on time and materials work.

CR109.2-110118

DIVISION 200 — EARTHWORK

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SECTION 201
CLEARING AND GRUBBING

Special Provisions

201-3.01 GENERAL. Add the following:

Perform the work necessary to preserve and/or restore land monuments and property corners from damage. Restore land monuments and/or property corners that are disturbed according to Section 642. An undisturbed area five feet in diameter may be left around existing monuments and property corners. A list of land monuments and property corners is shown on the Right of Way maps.

CR201.3-042313

Add the following:

Clearing and grubbing is not permitted within the migratory bird window of May 1 to July 15; except as permitted by Federal, State and local laws when approved by the Engineer.

CR201.1-010114

Add the following:

The work required to preserve and restore land monuments and property corners is subsidiary to 201 Pay Items.

CR201.3-042313

SECTION 202
REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Special Provisions

Replace Subsection 3.05 with the following:

202-3.05 REMOVAL OF PAVEMENT, SIDEWALKS, AND CURBS. In removing pavements, curbs, walks, driveways and similar structures, make all cuts clean, vertical, and true to designated lines where an abutting structure or a part of a structure is to be left in place.

Pavement materials, base course, sidewalks, curbs, gutters, etc., designated for removal may be placed in the embankment in accordance with 203-3.03 with written approval. Maximum allowed dimension of material is 6 inches.

Dispose of materials, not placed in the embankment, outside the right-of-way project limits according to Subsection 202-3.06.

CR202.2-040120

Add the following Subsection 202-3.06 Salvage and Disposal of Construction and Demolition Materials:

202-3.06 SALVAGE AND DISPOSAL OF CONSTRUCTION AND DEMOLITION MATERIALS. Unless otherwise noted, remove, handle, salvage, transport, store, and dispose waste materials according to the Occupational, Safety, and Health Administration (OSHA), Environmental Protection Agency (EPA), Alaska Department of Environmental Conservation (ADEC), and other Federal, State and local government agency's statutes, rules and regulations.

Use disposal sites outside the project right-of-way limits unless directed otherwise, in writing, by the Engineer. Obtain written consent from the private or public property owner for such disposal and a waiver of all claims against the State for any damage to such land which may result, together with all permits required by law for such disposal. Furnish a copy of such permission, waiver of claims, and permits to the Engineer before commencing work. Grade disposal areas to drain.

202-5.01 BASIS OF PAYMENT.

Add the following:

Acquiring waste disposal permits is subsidiary to 202 Pay Items.

CR202.1-040120

SECTION 203
EXCAVATION AND EMBANKMENT

Special Provisions

Add the following:

203-1.01 DESCRIPTION. Furnish and install the TECCO® System flexible slope stabilization comprised of wire mesh, anchors, miscellaneous hardware and testing at the locations shown on the Plans or as directed by the Engineer. Provide an experienced Supervisor on-site to direct all product installation.

Source the TECCO® flexible slope stabilization system from Geobrugg North America, LLC, Santa Fe, New Mexico.

Add the following

203-2.01 MATERIALS. Use materials that conform to the following:

7. Mesh:
   a. A minimum 0.118-inch diameter, alloyed high strength carbon steel wire with a minimum tensile strength 256 ksi. Galvanize with a 95% zinc and 5% aluminum coating with a minimum weight of 0.0256lb/ft^2.
   b. Woven construction and rhomboid shaped. Twist wire ends into loops and fasten together to prevent unraveling.
   c. Minimum mesh tensile strength of 10.2 kips/ft.
   d. Mesh openings are 3.27 inches by 5.63 inches (± 3%) with 3.67 meshes per foot going across the mesh and 2.13 meshes per foot going down the mesh. Depth is 0.43 inches (± 10%).

8. Connection Clips T3: A 4-millimeter diameter, high tensile spring steel clip with a minimum tensile strength of 256 ksi. Galvanize with a 94.5% zinc, 5% aluminum, and 0.5% Geobrugg Ultracoating with a minimum weight of 150g/m^2. Use clips to fasten mesh rolls together and to fasten the mesh to the boundary ropes.

9. Spike Plates: A steel, diamond shaped plate, 330 millimeters in length, 205 millimeters in width and 7 millimeters in thickness. Hot dip galvanize with a minimum layer thickness = 55 microns. Minimum longitudinal bending resistance is 2.5kNm and minimum spike length is 20 millimeters.

10. Boundary Ropes: A 0.5-inch diameter rope of 6x19 construction (or equivalent), IWRC and galvanized. Minimum breaking strength is 22.5 kips and meets Federal Specification RR-W-410D or equivalent including galvanizing.

11. Main Anchors: A minimum diameter of 1-inch solid threadbar, or 1.25-inch millimeters hollow core threadbar, with ball nuts and have a minimum yield stress is 75 ksi, meeting the requirements of ASTM A 615. Galvanize the anchors according to ASTM A 153. The minimum anchor length is in accordance with the Plans. Embedment depth is measured from the ground surface. Minimum anchor pullout capacity (design load) is 22.5 kips.

12. Secondary Nails: A minimum diameter of 0.75-inch millimeters solid threadbar, or 1-inch millimeters hollow core threadbar, with ball nuts and have a minimum yield stress of 75 ksi. Galvanize nails. The minimum nail length is in accordance with the Plans.

13. Splice Couplers: When required, use splice couplers to splice the anchors, capable of developing 100% of the guaranteed ultimate tensile strength of the anchors.

14. Centralizers: When shown in the Plans, install polyvinyl chloride (PVC) centralizers along the length of the anchor to ensure the anchor is centered in the drill hole and provides the minimum grout cover encapsulating the anchor. Centralizers are not required for self-drilling hollow core bar.

15. Miscellaneous Materials: Hot dip galvanize all miscellaneous material associated with the TECCO® System, such as wire rope, clips, thimbles, etc.

16. Grout: Use non-shrink Portland cement grout made with clean potable water and having a minimum unconfined compressive strength of 3,000 psi at 3 days.

17. Supervisor: Provide an on-site supervisor to direct the complete installation of the TECCO® System. Supervisor is to have worked on a minimum of three (3) similar projects and successfully completed the installation of the TECCO® System, or a similar product. On site supervisor requires approval of the Engineer and is designated the responsible person in charge of anchors, mesh and testing. The supervisor is to remain on site until the final product is accepted by the Engineer.

    Prepare a submittal providing the following information:

    a. Resume of Supervisor.
    b. Documentation showing the Supervisor has been a foreman for anchor installation for a minimum of two years.
    c. List and location of successful projects.
    d. Owner, owner's contact, address, and telephone number.

18. Safety Gear for the Engineer and Inspectors: Provide all safety gear, including but not limited to eye protection, climbing harnesses and training for the Department's on-site personnel who will be inspecting and working with the Contractor.

CFHWY00693

203-3.04 COMPACTION WITH MOISTURE AND DENSITY CONTROL. Add the following:

Compact the embankment within 20 feet of a bridge abutment full width to not less than 100 percent of the maximum density. Material used within this zone shall be graded to pass the 3 inch sieve.

CR203.3-110502R

Add the following:

Grading and placement of material used within 20 feet of bridge abutments will not be paid for directly but will be subsidiary to Pay Item 203.0006.____ Borrow.

CR203.3-110502R / CFHWY00693

Add the following

203-3.06 MESH INSTALLATION.

Step 1: Clear and grub the areas requiring slope stabilization as shown on the Plans, removing the brush, debris and loose rocks. Partially excavate the slope, working from the top down. Request acceptance of the cut slope by the Engineer prior to beginning the work required to install the TECCO® System.

Slope stabilization areas are to be excavated in stages. Install the TECCO® System from the top down as the excavation proceeds. Do not proceed to the next stage of excavation prior to the installation of TECCO® System on the previous level. If other methods are available to

insure safe construction of the slope with equal quality they may be considered by the Engineer.

Step 2: Locate the anchors on the slope, nominally as shown on the Plans. Install and test the anchors in accordance with the anchor manufacturer's recommendations and respective subsections of these specification.

Install anchors to the minimum depths shown on the Plans. Anchor embedment lengths may be reduced by up to 20 percent at the direction of the Engineer provided the specified pullout capacity is achieved as demonstrated by proof testing.

Install secondary nails (short nails/anchors) in shallow depressions (1 foot < 2 foot) in order to pull the mesh against the ground.

Step 3: After the anchors are installed and grouting placed--but before the grout sets-- form hollows 8 inches to 12 inches deep at each anchor. Clean all grout from anchor bar threads within the hollow. Install any required anchors for boundary ropes at the locations shown on the Plans.

Step 4: Lay the mesh on the slope by unrolling down the slope. The rolls can be shortened or lengthened as necessary by removing or adding sections, respectively. Overlap the mesh panels by a minimum of one mesh. Fasten the overlapped mesh panels with connection clips per manufacturer's recommendations.

Step 5: Install required boundary ropes and fasten the mesh to boundary ropes with connection clips per manufacturer's recommendations. Tighten boundary ropes and pull tight against ground.

Step 6: Place the spike plates onto the anchors. Using a hydraulic wrench, tighten the nuts and push the spike plates and mesh into the hollows to tension the mesh between 6.7 kips and 11.2 kips. Torque the nuts to the values given in Table 203-1 or as shown on the Plans.

TABLE 203-1 TORQUE TIGHTENING VALUES

Anchor Diameter	Prestress Force	Required Tightening Torque	
D=1-inch (25 mm)	6.7 kips (30 kN)	0.30 kN*m	221.3 ft-lbs
	11.2 kips (50 kN)	0.50 kN*m	368.8 ft-lbs
D=1.125-inch (28 mm)	6.7 kips (30 kN)	0.35 kN*m	258.1 ft-lbs
	11.2 kips (50 kN)	0.55 kN*m	405.7 ft-lbs
D=1.25-inch (32 mm)	6.7 kips (30 kN)	0.40 kN*m	295.0 ft-lbs
	11.2 kips (50 kN)	0.60 kN*m	442.5 ft-lbs

Add the following

203-3.07 ANCHOR INSTALLATION.

1. Self-Drilling Hollow Core Bar. Drill holes and prepare cement grout simultaneously to allow anchor installation and grouting in a single operation. Use a drill bit that allows cutting through different type of soil and weathered bedrock conditions. Provide drill bits with venturi holes to allow for proper tremie grouting.

2. Solid Threaded Reinforcing Steel. Drill holes and use centralizers to install anchor assemblies. Centralizers will adequately support the bar in the center of the drilled hole and be spaced at a maximum of 6 feet on center.

   Use drilling equipment designed to drill straight and of sufficient diameter to provide 1-inch grout cover over anchor. Methods, size and capability of the drilling equipment will be determined by the contractor. Where caving conditions are expected to occur, ensure sufficient casing and auger lengths are readily available on site to maintain uninterrupted installation of anchors. If the contractor proposes and the Engineer approves, hollow core self-drilling bar with adequate corrosion protection can be used at the locations were ground caving is expected to occur.

Variations in anchor locations up to 12 inches are allowed. However, the average spacing of three consecutive anchors is not exceed 9 feet horizontally or vertically. The variation in anchor angle can be +/-5 degrees without re-design. The Engineer will suspend construction if subsidence or other detrimental impact from drilling occurs.

Holes for production anchor assemblies and for test anchor assemblies will be the same diameter and utilize the same installation techniques, including grout.

Casing may be used to stabilize the holes, and will be removed prior to or during the grouting operation. For self-drilling bars, casing is not required.

Clean holes to remove material resulting from the drilling operations and to remove any other material that would impair the strength of the anchor assemblies or test anchor assemblies. Remove foreign material dislodged or drawn into the holes during construction of the assemblies.

Add the following

203-3.08 GROUTING. When using threaded reinforcing steel, the Inspector will monitor the length of the drilled hole before and during grouting.

When using self-drilling hollow core bars, continuously grout during the drilling operation through a rotary injection adapter attached to the end of the anchor. Grout will flow through the hollow core hole exiting through the drill bit holes. When self-drilling hollow core bar is used, drill cuttings can be mixed with cement grout.

In case of the solid reinforcing steel, inject grout at the low end of the drilled hole. Fill the entire drilled hole with a dense grout, free of voids or inclusion of foreign material.

Place grout the full length of the anchors. No cold joints are allowed for grout placement.

Use only clear, potable water, free of oil, acid, alkali, organic matter, or injurious quantities of chlorides, fluorides, sulfates and nitrates when mixing with Portland cement.

Use cement grout with a water/cement ratio as recommended by the manufacturer. Fine aggregate can be added but only to the extent that cement content of the grout is not less than 840 pounds per cubic yard of grout. Minimum grout compressive strength is 1,500 psi at the time of test anchor stressing.

Add the following

203-3.09 ANCHOR TESTING. Both verification and proof testing of the anchors is required. Provide all material, equipment, and labor to perform the tests. The Engineer will measure, and record all required data in an acceptable manner. No testing or stressing of anchors will be performed within 3 days of grouting anchors unless the strength of the grout has reached 50 percent of the 7 day strength.

1. Testing Equipment. Testing equipment will include two (2) dial gauges, a dial gauge support, jack and pressure gauge, an electric load cell, master pressure gauge and a reaction frame.

   Use a minimum of two dial gauges capable of measuring to 0.00001-inch (0.0025 mm) to measure the ground anchor movement. The dial gauges will have a minimum stroke equal to the theoretical elastic elongation of the total anchor length plus 1-inch (25 mm). Align the dial gauges within 5 degrees from the axis of the anchor. Use a hydraulic jack and pump to apply the test load.

   Use an independent testing laboratory to calibrate the jack and pressure gauge as a unit. The pressure gauge will be graduated in 150 psi increments or less and have a range not exceeding twice the anticipated maximum pressure during testing unless otherwise approved by Engineer. Use the pressure gauge to measure the applied load. The minimum ram travel of the jack will not be less

than the theoretical elastic elongation of the total anchor length at the maximum test load plus 1 inch (25 mm). The jack will be capable of applying each load in less than one minute.

Independently support and center the jack over the anchor so the anchor does not carry the weight of the jack. Keep a calibrated master pressure gauge at the site. Calibrate the master gauge with the test jack and pressure gauge as a unit. Monitor with both a pressure gauge and electric load cell the loads on the anchors during the verification tests. Provide recent calibration curves in accordance with required submittals. Place the stressing equipment over the anchor in a manner that the jack, bearing plates, load cell, and stressing anchorage are in alignment. Position the jack at the beginning of the test such that unloading and repositioning of the jack during the test will not be required.

Use a reaction frame sufficiently rigid and of adequate dimension such that excessive deformation of the test apparatus requiring repositioning of any components is avoided. No part of the reaction frame shall bear within 20 inches of the test anchor unless otherwise approved by Engineer.

2. Verification Testing. Perform verification testing prior to production anchor installation to verify the installation methods, soil conditions, and anchor capacity. Develop and submit the details of the verification testing arrangement including the method of distributing test load pressures to the excavation surface (reaction frame), anchor bar size, grouted hole diameter and reaction plate dimensioning. Perform all anchor testing using the same equipment, methods, and hole diameter as planned for the production anchors. As determined by the Engineer, additional verification testing is required for any changes in the drilling or installation method. The anchors used for the verification tests shall be sacrificial and shall not be incorporated into the production anchor schedule.

Install a minimum of two verification anchors. Successful verification tests are required prior to production anchor installation. The locations of the verification tests will be determined by the Contractor and approved by the Engineer. Incrementally load the verification test anchors to twice the design load and movements recorded by the Contractor in accordance with the following schedule:

AL	1 minute
0.25DL	10 minutes
0.50DL	10 minutes
0.75DL	10 minutes
1.00DL	10 minutes
1.25DL	10 minutes
1.50DL	60 minutes

AL = Anchor Alignment Load (0.05DL) DL = Anchor Design Load

Hold each load increment for a minimum of 10 minutes. Monitor the verification test anchor for creep at 1.50 DL load increment. Measure and record the anchor movements during the creep portion of the test at 1, 2, 3, 5, 6, 10, 20, 30, 50, and 60-minute increments. The Engineer may require extended creep measurements, monitoring and recording. Maintain all load increments within 5 percent of the intended load by use of the load cell. Unload the anchor in increments of 25 percent, measure and record deflections at each increment.

3. Proof Testing. Perform proof testing on at least 5 percent of the production anchors, with at least 5 tests in each of the top four rows of anchors, to verify methods and the design anchor capacity. The locations and number of these tests will be determined by the Engineer.

Perform proof tests by incrementally loading the anchor to 133 percent of the design load. The Engineer will measure and record the anchor movement at each load in the same manner as the verification tests. Monitor the load using pressure gauges with sensitivity and range meeting the requirements of pressure gauges used for verification test anchors. At load increments other than maximum test load, hold the load long enough to obtain a stable reading. Incremental loading for proof tests will be in accordance with the following schedule.

AL
0.25DL
0.50DL
0.75DL
1.00DL
1.33DL

AL = Anchor Alignment Load (0.05DL)
DL = Anchor Design Load

Maintain all load increments within 5 percent of the intended load. Depending on performance, perform either 10 minute or 60 minute creep tests at the maximum test load. The creep period starts as soon as the maximum test load is applied. Measure and record the anchor movement with respect to a fixed reference at 1, 2, 3, 5, 6, and 10 minute intervals. Where anchor movement between 1 minute and 10 minutes exceeds 0.04inch (1.0 mm), maintain the maximum test load an additional 50 minutes and record movements at 20 minutes, 30, 50, and 60 minutes. Bring to the attention of the Engineer, the anchors which fail in creep.

4. Test Anchor Acceptance. A test anchor is considered acceptable when:

a. For verification tests, a creep rate less than 0.08 inch (2.0 mm) per log cycle of time is observed during creep testing and the rate is linear or decreasing throughout the load hold.

b. For proof tests where less than 0.04 inch (1.0 mm) of movement is observed between the 1 minute and 10 minute interval during the 10 minute creep test or a creep rate less than 0.08 inch (2.0 mm) per log cycle of time is observed during the 60 minute creep test and the creep rate is linear or decreasing throughout the load hold period.

c. The maximum test load is sustained without reaching the failure point (pullout). The failure point is the point where the movement of the test soil anchor continues without an increase in the load. Record the failure load corresponding to the failure point as part of the test data.

Proof test anchors may be incorporated into the production anchor schedule provided:
(1) the minimum required hole diameter has been maintained, and
(2) the test anchor length is equal to or greater than the scheduled production anchor.

5. Test Anchor Rejection. Replace failed production anchors with a new anchor adjacent the failed anchor, at no additional cost. Additional proof testing for acceptance may be required as a result of the first failed anchor tests.

6. Alternate Anchor Test Method. At the direction of the Engineer, the following alternate test method may be used. Apply a load of 133 percent of the design load to the anchor. Hold the load for a minimum of 10 minutes, and record the pressure on the jack pressure gauge. The test anchor is considered acceptable when there is no change in the jack pressure gauge over the 10 minute hold at 133 percent of the design load.

Add the following

203-3.10 SUBMITTALS. Submit the following not less than three weeks prior to commencement of TECCO® System installation activities:

1. An anchor installation plan to be approved by the Engineer and containing the following:

   a. Choice of anchor type.
   b. Location and number of anchors to be tested.
   c. Mix design for cement grout including strength test results, additives, manufacturer's data sheets,

and procedure for placing grout.
d. Planned construction sequence.
e. Method for placing equipment at the anchor locations.
f. Drilling method and drill equipment.
g. Planned hole diameter and depth for each type of anchor proposed for use.
h. Calibration records of an independent testing facility for torque-wrenches and testing jacks. Complete calibration not later than 30 days prior to use of the wrenches or jacks.
i. Testing procedures and equipment to assure the specified load is reached and is transferred to the ground without creep and without exceeding extension limits of the anchor.
j. Resume of Supervisor per subsection 203-2.01.18.

Add the following

203-4.01 METHOD OF MEASUREMENT. By the square yard, in final position, measured on the excavated slope surface.

No allowance will be made for overlap, whether at joints or patches. Excavating the original slope and haul will be measured under item 203.0001.0000.

Add the following

203-5.01 BASIS OF PAYMENT. At the contract price per square yard complete and in-place. Excavating the original slope and haul will be paid under item 203.0001.0000. Price will be for full compensation for furnishing all labor, equipment, materials and testing to install the TECCO® System.

The following work is subsidiary:

1. Drilling
2. Additional excavation, special grading, leveling, depression filling, and haul
3. Backfilling or Shotcrete placement to fill depressions,
4. Required anchor testing
5. Grouting
6. Boundary ropes
7. Wire rope anchors, wire rope nails
8. All hardware including connection clips, centralizers, spike plates, splice couplers
9. Secondary nails
10. Overlap
11. Supervisor

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
203.0017.____	Rock Fall Mitigation – Wire Mesh	Square Yard

CFHWY00693

Special Provision

Replace Section 204 with the following:

SECTION 204
STRUCTURE EXCAVATION FOR CONDUITS AND MINOR STRUCTURES

204-1.01 DESCRIPTIONS. Excavate and backfill for conduits (pipe culverts, structural plate pipe, pipe arches, storm drains, underdrains, and electrical conduits), headwalls, manholes, inlet boxes, and other minor structures.

Perform all pumping, bailing, draining, sheeting, bracing, and incidentals required for proper execution of the work.

204-2.01 MATERIALS. Use materials that conform to the following:

Selected Material	Subsection 703-2.07
Porous Backfill Material	Subsection 703-2.10

1. Structure Backfill and Bedding Material: Selected Material Type A.

   Maximum Particle Size:

   a. Corrugated Steel and Aluminum Conduit: material passing the 3-inch sieve

   b. Precast Concrete Structures
      (1) Conduit: materials passing the 1-inch sieve, except 2-inch when bedding thickness is greater than 6 inches
      (2) Minor structures: material passing the 1-inch sieve

   c. Plastic Conduit: material passing the 2-inch sieve, except 3/4-inch for conduit between 8 inches and 15 inches and for conduit less than 8 inches 10% of the conduit diameter

   d. Electrical Conduit: material passing the 1-inch sieve

   e. Underdrain Conduit: uniform porous backfill material passing the 2-inch sieve and a minimum greater than the conduit perforations

2. Backfill Material: Selected Material Type C

In the roadbed structure use backfill material meeting the requirements of the roadbed structure, except use the structure backfill material and bedding as specified herein.

Use all suitable material from the project excavation for bedding, structure backfill, and backfill material before using material from another source.

204-3.01 CONSTRUCTION REQUIREMENTS. Clear and grub prior to starting excavation according to the requirements of Section 201.

Remove and dispose, Subsection 203-3.01, of unsuitable foundation material, including rock or other unyielding material, below the designed elevation as directed, except no less than 6 inches, and replace with approved material.

Place bedding material to a minimum thickness of 4 inches, except 6-inch minimum thickness for conduit over rock or unyielding material, and below electrical conduit, unless shown otherwise in the plans.

Place the bedding material to provide uniform support for conduit with the material in the middle one-third loosely placed and not compacted. Do not shape the bedding to the curvature of the round conduits. Shape the bedding for pipe arches, horizontal ellipse, and underpass shapes with spans exceeding 12 feet. Provide a minimum shaped width one-half the span of the pipe arch and underpass shapes and one-third the span of horizontal ellipse shape. Shape the bedding to the relatively flat bottom arc or fine-grade the foundation to a slight "V" shape.

Place minor precast concrete structures, other than conduits, on the 4-inch bedding/leveling course, of uniform stiffness and thickness with even compaction throughout.

Place the structure backfill over the bedding each side of the structure to 12 inches above the structure or the ground surface if less than 12 inches, except 6 inches above electrical conduit.

Place the structure backfill and backfill material in uniform layers not more than 6 inches deep. Do not create unbalanced loading with the placement of the structure backfill materials. When placing material against concrete, place the material according to the requirements of Section 550.

Compact the materials, each layer, without ponding or jetting to meet Subsection 203-3.04. In the haunch area, each side of the conduit, compact the material by firmly tamping into place.

Outside the roadbed structure, the Engineer may visually inspect and approve the excavation, bedding, structure backfill, backfill material, and compaction.

Support and protect existing conduits or utilities, not scheduled for removal or abandonment, when encountered in the excavation.

Remove all sheeting and bracing used in structure excavation upon completion of the work.

204-4.01 METHOD OF MEASUREMENT. Section 109. Use neat line method as follows:

Structure Excavation:

1. Masonry Structures (except conduit). Between vertical planes, 18 inches outside the base of the masonry sections for the depth required.

2. Conduit. Between parallel vertical planes located 18 inches outside the horizontal projection of the outside diameter of the conduit and to the depth shown on the Plans.

Structure excavation only measured below the limits of other classes of excavation. Structure's in embankment section, the natural ground line as cross-sectioned is the uppermost level of computation.

204-5.01 BASIS OF PAYMENT. The Contract price includes the placing and compacting of all backfill and bedding when the materials used are obtained from excavation, any clearing and grubbing required and not paid for under some other item, formation of any embankments made with surplus material from structure excavation, and disposal of all surplus or unsuitable excavation.

Additional excavation to provide for shoring, sheet piles, excavation shields or flattening the excavation slopes, is subsidiary.

When item 204.0001.____, structure Excavation, does not appear in the bid schedule, structure excavation required to complete other items of work is subsidiary, except that excavation and disposal of unsuitable material required from below a plane 12 inches below the invert elevation of conduits and 12 inches below the bottom of structures is paid as extra work.

Any backfill or bedding material required whose source is other than project excavation is paid at the contract unit price for the materials being used, or as extra work if no unit price has been established.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
204.0001.____	Structure Excavation	CY
204.0002.____	Structure Excavation	TON
204.0003.____	Structure Excavation	LS

CR204-010119R

DIVISION 300 — BASES

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SECTION 301
AGGREGATE BASE AND SURFACE COURSE

Special Provision

301-2.01 MATERIALS. Add the following after the first sentence:

Recycled Asphalt Material (RAM) may be substituted for aggregate base course, inch for inch, if the following conditions are met:

1. RAM shall be crushed or processed to 100 percent by weight passing the 1.5 inch sieve and 95-100 percent by weight passing the 1 inch sieve.

2. The gradation of the extracted aggregate shall meet the following:

Sieve	Percent Passing by Weight
1 inch	100
3/4 inch	70 – 100
3/8 inch	42 – 90
No. 4	28 – 78
No. 16	11 – 54
No. 50	5 – 34
No. 100	3 - 22
No. 200	2 – 12

3. The asphalt content shall be 2.5 – 5.0 percent by weight of the RAM.

CR301.1-012407R

301-3.01 PLACING. Add the following:

Place base course material, used for the sidewalk and pathway foundations, with equipment capable of providing a specified depth and uniform surface.

CR301.2-062116

301-3.03 SHAPING AND COMPACTION. Add the following:

If recycled asphalt material is substituted for aggregate base course, the following conditions shall be met:

1. Density acceptance will be determined by control strip method ATM 412. Use a test strip with a vibratory compactor with a minimum dynamic force of 40,000 pounds. The optimum density will be determined by the Engineer using a nuclear densometer gauge to monitor the test strip. Adequate water shall be added to aid compaction.

2. After the appropriate coverage with the vibratory compactor, a minimum of 6 passes with a pneumatic tire roller shall be completed. Tires shall be inflated to 80 psi (± 5 psi) and the roller shall have a minimum operating weight per tire of 3,000 pounds.

301-5.01 BASIS OF PAYMENT. Add the following:

Recycled asphalt material substituted for aggregate base course will be paid for as Item 301.0001.____ Aggregate Base Course, at the unit price shown in the bid schedule for that Item.

CR301.1-012407R

Special Provision

Replace Section 306 with the following:

SECTION 306
ASPHALT TREATED BASE COURSE

306-1.01 DESCRIPTION. Construct a plant-mixed asphalt treated base (ATB) course on an approved foundation to the lines, grades, and depths shown in the Plans. Recycled asphalt pavement (RAP) may be used in the mix as specified herein.

306-1.02 REFERENCE.

1. Section 401, Hot Mix Asphalt and Surface Treatments.

MATERIALS

306-2.01 COMPOSITION OF MIXTURE - JOB MIX DESIGN (JMD). Design the JMD according to the Alaska Test Manual (ATM) 417 using the design requirements of Table 306-1 and as specified herein. Recycled Asphalt Pavement may be used to supplement the aggregate and asphalt binder in the ATB.

TABLE 306-1

ATB DESIGN REQUIREMENTS

DESIGN PARAMETERS	CLASS "B"
ATB (Including Asphalt Binder)	
Stability, Pounds	1200 min.
Flow, 0.01 Inch	8 - 16
Voids in Total Mix, %	3 – 5
Compaction, Number of Blows Each Side of Test Specimen	50
Asphalt Binder	
Percent Voids Filled with Asphalt Binder (VFA)	65 - 78
Asphalt Binder Content, Min. %	5.0
Dust-Asphalt Ratio*	0.6 - 1.4
Voids in the Mineral Aggregate (VMA), %, Min.	
Type II	12.0
Recycled Asphalt Pavement (RAP)	
RAP, Max. %.	25

*Dust-asphalt ratio is the percent of material passing the No. 200 sieve divided by the percent of effective asphalt binder.

The JMD will specify the Target Values (TV) for gradation, the TV for asphalt binder content, the Maximum Specific Gravity (MSG) of the ATB, the additives, and the allowable mixing temperature range.

Target values for gradation in the JMD must be within the broad band limits shown in Table 703-4. For acceptance testing, ATB mixture will have the full tolerances in Table 306-2 applied.

Do not mix ATB produced from different plants for testing or production paving. ATB from different plants will be rejected.

Submit the following to the Engineer at least 15 days before the production of ATB:

1. A letter stating the location, size, and type of mixing plant, the proposed gradation for the JMD including gradations for individual virgin aggregate (aggregate) stockpiles and the RAP stockpile. Provide supporting process quality control information; including the blend ratio of each aggregate stockpile, the RAP stockpile and the RAP asphalt binder content. For mixes with RAP, provide JMD gradation with and without RAP. Provide calibration data if ATM 406 is used for RAP process control.

2 Representative samples of each aggregate (coarse, intermediate, fine, blend material and mineral filler, if any) and RAP required for the proposed JMD. Furnish 100 lbs of each intermediate and/or coarse aggregate, 200 lbs of fine aggregate, 25 lbs of blend sand, and 200 lbs of RAP.

3. Three separate 1-gallon samples, minimum, of the asphalt binder proposed for use in the ATB. Include name of product, manufacturer, test results of the applicable quality requirements of Subsection 702-2.01, manufacturer's certificate of compliance according to Subsection 106-1.05, a temperature viscosity curve for the asphalt binder or manufacturer's recommended mixing and compaction temperatures, and current Material Safety Data Sheet (MSDS).

4. One sample, of at least 1/2 pint, of the anti-strip additive proposed, including name of product, manufacturer, and manufacturer's data sheet, and current MSDS.

The Engineer will evaluate the material and the proposed gradation using ATM 417 and Table 306-1 ATB Design Requirements.

The mix, the materials and proposed gradation meeting the specification requirements will become part of the Contract when approved, in writing, by the Engineer.

FAILURE TO MEET SPECIFICATION REQUIREMENTS

Submit a new JMD with changes noted and new samples in the same manner as the original JMD when:

- The results do not achieve the requirements specified in Table 306-1
- The asphalt binder source is changed
- The source of aggregate, aggregate quality, gradation, or blend ratio is changed
- The source of RAP is changed

Do not produce ATB for production paving and payment before the Engineer provides written approval of the JMD, the original or a new replacement JMD.

Payment for ATB will not be made until the new JMD is approved. Approved changes apply only to ATB produced after the submittal of changes.

The Engineer will assess a fee for each mix design subsequent to the approved Job Mix. The fee will be included under Pay Item 306.2001.____ ATB, Price Adjustment, Type ___; Class__.

306-2.02 AGGREGATES. Conform to Subsection 703-2.04. Type II, Class B (IIB) total combined aggregates.

Use a minimum of three stockpiles for crushed ATB aggregate (coarse, intermediate, and fine). Place RAP, blend material and mineral filler in separate piles.

306-2.03 ASPHALT BINDER. Conform to 702-2.01. If asphalt binder is not specified use PG 52-28.

The total asphalt binder content may be a combination of the asphalt binder specified and the residual asphalt binder in the RAP.

Provide test reports for each batch of asphalt binder showing conformance to the specifications in Section 702, before delivery to the project. Require that the storage tanks used for each batch be noted on the test report, the anti-strip additives required by the mix design be added during load out for delivery to the project, and a printed weight ticket for anti-strip is included with the asphalt binder weight ticket. The location where anti-strip is added may be changed with the written approval of the Engineer.

Furnish the following documents at delivery:

1. Manufacturer's certificate of compliance (Subsection 106-1.05).
2. Conformance test reports for the batch (provide prior to delivery as noted above).
3. Batch number and storage tanks used.
4. Date and time of load out for delivery.
5. Type, grade, temperature, and quantity of asphalt binder loaded.
6. Type and percent of anti-strip added.

306-2.04 ANTI-STRIP ADDITIVES. Use anti-strip agents in the proportions determined by ATM 414 and included in the approved JMD. At least 70% of the aggregate must remain coated when tested according to ATM 414. A minimum of 0.25% by weight of asphalt binder is required.

306-2.05 PROCESS QUALITY CONTROL. Sample and test materials for quality control of the ATB according to Subsection 106-1.03. Submit to the Engineer, with the JMD, a documentation plan that will provide a complete, accurate, and clear record of the sampling and testing results. When directed by the Engineer, adjust the plan and resubmit.

Submit a paving and plant control plan at the pre-paving meeting to be held a minimum of 7 days before initiating pre-paving operations. Address the sequence of operations. Outline steps to provide product consistency, to minimize segregation, to prevent premature cooling of the ATB, and to provide the mat density required by these specifications. Include a proposed quality control testing frequency for gradation, asphalt binder content, and compaction.

Failure to perform quality control forfeits the Contractor's right to a retest under Subsection 306-4.02.

Provide copies of the documented sampling and testing results no more than 24 hours from the time taken.

306-2.06 RECYCLED ASPHALT PAVEMENT (RAP). Process existing pavement removed under Subsection 202-3.07 so material passes the 1 1/2" sieve. Stockpile the material separately from the crushed aggregates. Perform one gradation and one asphalt binder content test for every 1000 tons of RAP or a minimum of 10 sets of tests whichever is greater.

CONSTRUCTION REQUIREMENTS

306-3.01 WEATHER LIMITATIONS. Do not place ATB on a wet surface, on an unstable/yielding roadbed, when the base material is frozen, or when weather conditions prevent proper handling or finishing of the mix. Do not place ATB unless the roadway surface temperature is 40°F or warmer.

306-3.02 EQUIPMENT, GENERAL. Use equipment in good working order and free of ATB buildup. Make equipment available for inspection and demonstration of operation a minimum of 24 hours before placement of production ATB.

306-3.03 ASPHALT MIXING PLANTS. Meet AASHTO M 156. Use an asphalt plant designed to dry aggregates, maintain accurate temperature control, and accurately proportion asphalt binder and aggregates. Calibrate the asphalt plant and furnish copies of the calibration data to the Engineer at least 4 hours before ATB production.

When using recycled asphalt pavement material, mix the RAP with the aggregate before the aggregate enters the plant thereby adding the RAP combined with the aggregate to the asphalt treated base mixture at one time.

Provide a scalping screen at the asphalt plant to prevent oversize material or debris from being incorporated into the ATB.

Provide a tap on the asphalt binder supply line just before it enters the plant (after the 3-way valve) for sampling asphalt binder.

Provide aggregate and asphalt binder sampling equipment meeting OSHA safety requirements.

306-3.04 HAULING EQUIPMENT. Costs associated with meeting the requirements of Subsection 306-3.04 are subsidiary to Section 306 Pay Items.

Vehicles/Equipment. Haul ATB in trucks with tight, clean, smooth metal beds, thinly coated with a minimum amount of paraffin oil, lime water solution, or an approved manufactured asphalt release agent. Do not use petroleum fuel as an asphalt release agent.

During ATB hauling activities, the hauling vehicle will have covers attached and available for use. Be prepared to demonstrate deployment of the cover when hauling material or empty. Illustrate the efficiency of deployment and how the materials are protected from the environment and the environment is protected from the materials. When directed by the Engineer, cover the ATB in the hauling vehicle(s).

Roadway Maintenance. Daily inspect, remove/clean, and dispose of project materials deposited on existing and new pavement surface(s) inside and outside the project area including haul routes.

The inspection plan and method of removal/cleaning and disposal shall be submitted in writing to the Engineer and approved by the Engineer 7 days before initiating paving operations. Include alternatives, options to immediately correct deficiencies in the inspection plan and methods of removal/cleaning and disposal that may be discovered as the work is being performed.

The Engineer may require the Contractor to include a vehicle/equipment cleaning station(s), to be added at the project site and or at the plant, in the basic plan or as one of the corrective alternatives/options. At a minimum, the cleaning station will include the materials and means to:

(1) Spray truck tires with an environmental degradable release agent if mix adheres to tires before dumping in front of the paving equipment.
(2) Clean off loose mix from gates, chains, and tires that might fall on the pavement of the haul route.
(3) Contain, collect and disposal of (1) and (2).

The Contractor is responsible for the inspection plan, the means, and methods used for removal/cleaning and disposal of fugitive materials/debris. The Contractor is responsible for the damage as a result of not removing these materials (to the roadway material, the users, and others) and the damage to the roadway materials from the removal method(s). Approval does not change the Contractor's responsibility, nor add responsibility to the Department for this work.

Repair damage, as specified in Subsection 306-3.16 Patching Defective Areas, to the existing roadway materials (asphalt type) as a result of the fugitive materials or their removal. Use repair materials of similar type to the damaged material. Attain written approval from the Engineer for the proposed material.

306-3.05 PAVING EQUIPMENT. Use self-propelled asphalt pavers with a heated vibratory screed. Control grade and cross slope with automatic grade and slope control devices. Use an erected string line, a 30-foot minimum mobile stringline (ski), or other approved grade follower, to automatically actuate the screed or blade control system. Use grade control on either (a) both the high and low sides or (b) grade control on the high side and slope control on the low side.

Use a paver screed assembly that produces a finished surface of the required smoothness, thickness, and texture without tearing, shoving, or displacing the ATB.

Equip pavers with a receiving hopper having sufficient capacity for a uniform spreading operation and a distribution system to place the ATB uniformly in front of screed.

Prevent segregation of the coarse aggregate particles from the remainder of the ATB during paving operations. Specifically equip pavers to prevent segregation between the hopper and augers. Use means and methods approved by the paver manufacturer. Means and methods may include chain curtains, deflector plates, or other similar devices or combination of devices. When required by the Engineer, provide a Certificate of Compliance verifying use of the means and methods required to prevent segregation.

306-3.06 ROLLERS. Use both steel-wheel (static or vibratory) and pneumatic-tire rollers. Avoid crushing or fracturing of aggregate. Use rollers designed to compact ATB asphalt mixtures and reverse without backlash.

All rollers shall have an attached infrared thermometer that measures and displays the surface temperature to the operator.

Use fully skirted pneumatic-tire rollers having a minimum operating weight of 3000 pounds per tire.

306-3.07 PREPARATION OF EXISTING SURFACE. Prepare base surface conforming to the Plans and Specifications.

Before placing the hot asphalt mix, apply tack coat material (Section 702) as specified here and in Section 402. Uniformly coat contact surfaces of curbing, gutters, sawcut pavement, cold joints, manholes, and other structures with tack coat material. Allow tack coat to break before placement of ATB on these surfaces.

306-3.08 PREPARATION OF ASPHALT. Provide a continuous supply of asphalt binder to the asphalt mixing plant at a uniform temperature, within the allowable mixing temperature range.

306-3.09 PREPARATION OF AGGREGATES. Dry the aggregate so the moisture content of the ATB, sampled at the point of acceptance for asphalt binder content, does not exceed 0.5% (by total weight of mix), as determined by ATM 407.

Heat the aggregate for the ATB, and the RAP when being used in the mix, to a temperature compatible with the mix requirements specified.

Adjust the burner on the dryer to avoid damage to the aggregate and to prevent the presence of unburned fuel on the aggregate. ATB containing soot or fuel is unacceptable (Subsection 105-1.11).

306-3.10 MIXING. Combine the aggregate, asphalt binder, and additives in the mixer in the amounts required by the JMD. Mix to obtain 98% coated particles when tested according to AASHTO T 195.

306-3.11 TEMPORARY STORAGE. Silo type storage bins may be used, provided the characteristics of the ATB remain unaltered. Changes in the JMD, visible or otherwise, are cause for rejection. Changes may include: visible segregation, heat loss; and the physical characteristics of the asphalt binder, lumpiness, or stiffness of the ATB or similar.

306-3.12 PLACING AND SPREADING. Use asphalt pavers to distribute ATB. Place the ATB upon the approved surface, spread, strike off, and adjust surface irregularities. The maximum compacted lift thickness allowed is 3 inches.

During placement, the Engineer, using an infrared camera, may evaluate the ATB surface immediately behind the paver for temperature uniformity. Areas with temperature differences more than 25° F lower than the surrounding ATB may produce areas of low density. Contractor shall immediately adjust laydown procedure to maintain a temperature differential of 25° F or less. Thermal images and thermal profile data will become part of the project record and shared with the Contractor.

Use hand tools to spread, rake, and lute the ATB in areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable.

When the section of roadway being paved is open to traffic, pave adjacent traffic lanes to the same elevation within 24 hours. Place approved material against the outside pavement edge when the drop-off exceeds 2 inches.

Do not cover/place over the asphalt treated base material until the ATB material throughout that section, as defined by the Paving Plan, is placed and accepted.

Do not pave against new Portland cement concrete curbing until it has cured for at least 72 hours.

Do not place ATB over bridge deck membranes, except as directed by the Engineer.

306-3.13 COMPACTION. Compact the ATB by rolling thoroughly and uniformly. In areas not accessible to large rollers, compact with mechanical tampers or trench rollers. Prevent indentation of ATB. Do not leave rollers or other equipment standing on ATB that is not sufficiently cooled to prevent indentation.

A mat area with density lower than 92.0 % MSG is considered segregated and not in conformance with the requirements of the Contract. The work shall be deemed unacceptable by the Engineer according to Subsection 105-1.11 unless, the Engineer determines that reasonably acceptable work has been produced as permitted in Subsection 105-1.03.

The MSG of the JMD will be used for the first lot of ATB. The MSG for additional lots will be determined from the first sublot of each lot.

Acceptance testing for density will be performed according to ATM 410 using a 6 inch diameter core.

306-3.14 JOINTS. Minimize the number of joints. Do not construct longitudinal joints in the driving lanes unless approved by the Engineer in writing at the Pre-paving meeting. Place and compact the ATB to provide a continuous bond, texture, and smoothness between adjacent sections of the ATB.

Coordinate the joints in the ATB pavement layer with the layer of HMA pavement above. Offset the longitudinal joints in the HMA pavement layer above from the joint in the ATB asphalt pavement layer immediately below by at least 6 inches.

Form transverse joints by cutting back on the previous run to expose the full depth of the layer. Saw cut the joint, use a removable bulkhead or other method approved by the Engineer.

Remove to full depth improperly formed joints resulting in surface irregularities. Before removing pavement, cut a neat straight line along the pavement to be removed and the pavement to remain. Use a power saw or other method approved by the Engineer. Replace the removed asphalt with new ATB and thoroughly compact.

306-3.15 SURFACE TOLERANCE. Costs associated with meeting surface tolerances are subsidiary to the ATB Pay Items.

The Engineer will test the finished surface after final rolling at selected locations using a 10 ft straightedge. Correct variations from the testing edge, between any two contacts, of more than 1/4 inch.

306-3.16 PATCHING DEFECTIVE AREAS. Costs associated with patching defective areas are subsidiary to the ATB Pay Items.

Remove defective ATB for the full thickness of the course, do not skin patch. Cut the pavement so that edges are vertical and the sides are parallel to the direction of traffic. Coat edges with a tack coat meeting Section 402 and allow to cure. Place and compact fresh ATB to grade (Subsection 306-3.13) and surface tolerance requirements (Subsection 306-3.15).

306-4.01 METHOD OF MEASUREMENT. Section 109 and the following:

1. Asphalt Treated Base.

   a) By weighing. No deduction will be made for the weight of asphalt binder or anti stripping additive or cutting back joints.

2. Asphalt Binder. By the ton, as follows.

   Method 1:

   Percent of asphalt binder for each sublot multiplied by the total weight represented by that sublot. The same tests used for the acceptance testing of the sublot will be used for computation of the asphalt binder quantity. If no acceptance testing is required, the percent of asphalt binder is the target value for asphalt binder in the JMD.

   Method 2:

   Supplier's invoices minus waste, diversion, and remnant. This procedure may be used on projects where deliveries are made in tankers and the asphalt plant is producing ATB for one project only.

   The Engineer may direct, at any time that tankers be weighed in the Engineer's presence before and after unloading. If the weight determined at the project varies more than 1% from the invoice amount, payment will be based on the weight determined at the project.

   Any remnant or diversion will be calculated based on tank stickings or weighing the remaining asphalt binder. The Engineer will determine the method. The weight of asphalt binder in waste ATB will be calculated using the target value for asphalt binder as specified in the JMD.

   Method 1 will be used for determining asphalt binder quantity unless otherwise directed in writing. The procedure initially used will be the one used for the duration of the project. No payment will be made for any asphalt binder more than 0.4% above the optimal asphalt binder content specified in the JMD.

3. ATB, Price Adjustment, Type ; Class . By the fees specified in Subsections 306-2.01, 4.02, and 5.01.

306-4.02 ACCEPTANCE SAMPLING AND TESTING.

1. Asphalt Treated Base

The bid quantity of ATB produced and placed is divided into lots and the lots evaluated individually for acceptance.

A lot is normally 10,000 tons. The lot is divided into sublots of 1000 tons, each randomly sampled and tested for asphalt binder content, density, and gradation according to this subsection. The lot is evaluated for acceptance according to Subsection 306-4.03. Seasonal startup or a new JMD requires starting a new lot.

If less than 8 sublots have been placed at the time a lot is terminated, the material in the shortened lot will be included as part of the prior lot. The acceptance computed for the prior lot will include the samples from the shortened lot. Density test results from material in the shortened lot will be based on the MSG of the first sublot of the shortened lot. If there is no prior lot, and there are at least 3 sublots, the material in the shortened lot will be considered as a lot and acceptance will be based on the actual number of test results in the shortened lot. If there are less than 3 sublots, the ATB will be accepted for payment based on the Engineer's approval of the JMD, and placement and compaction of the ATB to the specified depth, finished surface requirements, and tolerances.

If 8 or 9 sublots have been placed at the time a lot is terminated, they will be considered as a lot and the acceptance will be based on the actual number of test results (excluding outliers) in the shortened lot.

If the bid quantity is between 3,000 to 10,000 tons, the quantity is considered one lot. The lot is divided into sublots of 1000 tons, and each randomly sampled and tested for asphalt binder content, density, and gradation according to this subsection.

ATB quantities of less than 600 tons remaining after dividing the Contract quantity into sublots will be included in the last sublot. ATB quantities of 600 tons or greater will be treated as an individual sublot.

For bid quantity less than 3,000 tons, ATB will be accepted for payment based on the Engineer's approval of a JMD and the placement and compaction of the ATB to the specified depth and finished surface requirements and tolerances.

The Engineer reserves the right to perform any testing required in order to determine acceptance.

a. Asphalt Binder Content. ATB samples shall be taken randomly by the Contractor in the presence of the Engineer from behind the paver screed before initial compaction, or will be taken randomly by the Engineer from the windrow according to ATM 402 or ATM 403 at the discretion of the Engineer. The location (behind the paver screed or windrow) will be determined at the pre-paving meeting. The Engineer will determine random sampling locations.

   Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if requested. At the discretion of the Engineer, asphalt binder content will be determined according to ATM 405 or ATM 406, except ATM 405 will not be used when RAP is included in the mixture.

b. Aggregate Gradation. Aggregates tested for gradation acceptance will have the full tolerances from Table 306-2 applied. For ATB samples, the gradation will be determined according to ATM 408 from the aggregate remaining after the ignition oven (ATM 406) has burned off the asphalt binder.

c. Density. The Engineer will determine and mark the location(s) where the Contractor takes each mat core sample. The location(s) for taking core samples is determined using a set of random numbers (independent of asphalt binder and aggregate sampling set of random numbers) and the Engineer's judgment. Take no mat cores within 1-foot of a joint or edge. Core samples are not taken on bridge decks.

Take core samples according to ATM 413 in the presence of the Engineer. Cut full depth core samples centered on the marks from the finished ATB within 24 hours after final rolling. Neatly core drill one six inch diameter sample at each marked location. Use a core extractor to remove the core - do not damage the core. The Engineer will immediately take possession of the samples. Backfill and compact voids left by coring with new ATB within 24 hours and according to ATM 413. The Engineer will determine density of samples according to ATM 410.

d. Asphalt Binder Content, Aggregate Gradation, and Density – Retest. When test results have failed to meet specifications, retest of acceptance test results for asphalt binder content, gradation, and density may be requested provided the quality control requirements of Subsection 306-2.05 Process Quality Control are met. Deliver this request in writing to the Engineer within 7 days of receipt of the final test of the lot. The Engineer will mark the sample location for the density retest within a 2 foot radius of the original core. The original test results are discarded and the retest result is used to evaluate the material for acceptance. Only one retest per sample is allowed. When gradation and asphalt binder content are determined from the same sample, a request for a retest of either gradation or asphalt binder content results in a retest of both. Both gradation and asphalt binder content retest results are used in the evaluation. Except for the first lot, retesting for gradation or asphalt binder from the first sublot of a lot will include retesting for the MSG. Retesting will be performed by the Department's regional laboratory.

2. Asphalt Binder

The bid quantity of asphalt binder produced and placed is divided into lots and the lots evaluated individually for binder grade acceptance.

Testing will be by AASHTO accredited independent laboratories. When retesting is requested, the assigned value (ATV) will be determined using ASTM D3244. Each test will be completed by a different laboratory.

a. Acceptance Test. The lot size for asphalt binder will normally be 200 tons. If a project has more than one lot and the remaining asphalt binder quantity is less than 150 tons, it is added to the previous lot and that total quantity will be evaluated as one lot. If the remaining asphalt binder quantity is 150 tons or greater, it is sampled, tested and evaluated as a separate lot.

If the bid quantity of asphalt binder is between 85 to 200 tons, the bid quantity is considered as one lot and sampled, tested, and evaluated according to this subsection. Quantities of asphalt binder less than 85 tons will be accepted based on manufacturer’s certified test reports and certification of compliance.

Sample asphalt binder at the plant from the supply line in the presence of the Engineer according to ATM 401. The Engineer will take immediate possession of the samples. Take three samples from each lot, one for acceptance testing, one for Contractor requested retesting, and one held in reserve for referee testing if requested. Meet Subsection 702-2.01 requirements for asphalt binder quality.

b. Retest. Submit a written request, for a retest, no more than 7 days from receiving notice of the failed acceptance test. In the request, identify the retest laboratory. The Engineer will send the second sample (retest sample) to the laboratory. Provide the retest results to the Engineer. Contractor pays for the retest costs.

If the average of the combined test results ([acceptance + retest]/2) passes the specification requirement, the average value becomes the ATV. If this ATV fails the specification requirement, the Engineer or Contractor may request the third sample (referee sample) be tested.

c. Referee Test. The Engineer will send the third sample (referee sample) to an agreed upon laboratory. The average of the combined test results ([acceptance + retest + referee]/3) equals the ATV. If the ATV fails to meet specifications, the Contractor pays for the referee test.

306-4.03 EVALUATION OF MATERIALS FOR ACCEPTANCE. A mat area of finished surfacing that is contaminated with foreign material; is segregated (determined visually or by testing), has a lower density than specified, fails to meet surface tolerance requirements, is flushing or bleeding asphalt binder after compaction is complete, or in any other way determined to be defective is unacceptable according to Subsection 105-1.11. ATB, not meeting the specified limits noted in Table 306-2, is considered defective. Correct unacceptable work and materials according to Subsection 306-3.16 and as directed by the Engineer.

TABLE 306-2

LOWER SPECIFICATION LIMIT (LSL) & UPPER SPECIFICATION LIMIT (USL)

Measured Characteristics	LSL	USL
3/4-inch sieve or largest sieve size	99	100
1/2-inch sieve or first sieve retaining aggregate	TV -6	TV +6
3/8-inch sieve	TV -6	TV +6
No. 4 sieve	TV -6	TV +6
No. 8 sieve	TV -6	TV +6
No. 16 sieve	TV -5	TV +5
No. 30 sieve	TV -4	TV +4
No. 50 sieve	TV -4	TV +4
No. 100 sieve	TV -3	TV +3
No. 200 sieve*	TV -2.0	TV +2.0
Asphalt Binder Content, %	TV -0.4	TV +0.4
Mat Density %	92.0	100.0

*LSL for the No. 200 sieve is restricted by the broadband limits in Table 703-4.

Asphalt binder will be randomly sampled and tested in accordance with Subsection 306-4.02. Provide supplier process control test results with the delivery ticket for each load of asphalt binder to the Engineer before unloading asphalt binder at the project. No payment will be made without this documentation.

306-4.04 ASPHALT MATERIAL PRICE ADJUSTMENT. Asphalt Material Price Adjustment. This subsection provides a price adjustment for asphalt material by: (1) additional compensation to the contractor or (2) a deduction from the contract amount.

1. This provision shall apply:

   a. To asphalt material meeting the criteria of Subsection 702-2.01 Asphalt Binder, and is included in items listed in the bid schedule of Sections 306, 307, 308, 318, 401 thru 405, 408, 520, 608 and 609.

   b. To cost changes in asphalt material that occur between the date of bid opening and the date on the certified bill of lading from the asphalt material refiner/producer.

   c. When there is more than a seven and one half percent (7.5%) increase or decrease in the Alaska Asphalt Material Price Index, AAMPI, from the date of bid opening to the date on the certified bill of lading from the asphalt refiner/producer.

2. Provide the certified bill of lading from the asphalt material refiner/producer.

3. The AAMPI is calculated bimonthly on the first and third Friday of each month, and will remain in effect from the day of calculation until the next bimonthly calculation. The AAMPI is posted on the Department's Statewide Materials website at and calculated according to the formula posted there. http://www.dot.state.ak.us/stwddes/desmaterials/aprice_index.shtml

4. Price adjustment will be cumulative and calculated with each progress payment. Use the AAMPI in effect on the date of the certified bill of lading from the asphalt material refiner/producer, to calculate the price adjustment for asphalt material The Department will increase or decrease payment under this contract by the amount determined with the following asphalt material price adjustment formula:

   For an increase exceeding 7.5%, additional compensation = [(IPP – IB) – (0.075 x IB)] x Q

   For a decrease exceeding 7.5%, deduction from contract = [(IB – IPP) – (0.075 x IB)] x Q
   Where:

   Q = Quantity of Asphalt Material incorporated into project, in tons as measured by the Engineer

   IB = Index at Bid: the Bi-monthly AAMPI in effect on date of bid, in dollars per ton

   IPP = Index at Pay Period: The bi-monthly AAMPI in effect on the date shown on the certified bill of lading from the asphalt refiner/producer, in dollars per ton

5. Method of measurement for determining Q (quantity) is the weight of asphalt material that meets the criteria of this subsection and is incorporated into the project. The quantity does not include aggregate, mineral filler, blotter material, thinning agents added after material qualification, or water for emulsified asphalt. The quantity for emulsified asphalts will be based on the asphalt residue material only and will be calculated using the percent residue from testing, or if not tested, from the manufacturer's certificate of compliance.

306-5.01 BASIS OF PAYMENT.

Except where specified as individual Pay Items the work and materials associated with:

Asphalt binder, anti-stripping additives, surface tolerance corrections, patching defective areas; removal and disposal of rejected ATB, and the hauling equipment are subsidiary to the Asphalt Treated Base Pay Items.

Item 306.2001·____· ATB, Price Adjustment, Type ___; Class __: is the sum of the price adjustment for the fees assessed the Contractor including:

- Each mix design subsequent to the approved Job Mix Design (Subsection 306-2.01) will result in a fee of $2500.00 each.
- Failure to cut core samples within the specified period will result in a fee of $100.00 per sample per day (Subsection 306-4.02).
- Failure to backfill voids left by sampling within the specified period will result in a fee of $100 per hole per day (Subsection 306-4.02).
- Contractor retesting, referee sample testing and Contractor requested testing for visually inspected and rejected asphalt treated base failing to meet specifications will result in a fee being assessed for all costs associated with the test (Subsection 306-4.02, 4.03).

Item 306.2002.____. Asphalt Material Price Adjustment.

For each Section as included in Subsection 306-4.04 Asphalt Material Price Adjustment, item 1, the "Asphalt Material Price Adjustment" is paid under the asphalt material Pay Item for the Section with the greatest quantity as determined by the estimate of quantities included in the Plans at the time of the bid opening.

- When more than one "Asphalt Material Price Adjustment" Pay Item is included in the Plans or bid schedule the asphalt material price adjustment, for each Section's asphalt material, is paid under the Pay Item with the greatest quantity.
- When more than one asphalt material is included in the project and only one "Asphalt Material Price Adjustment" Pay Item is included in the Plans or bid schedule, the asphalt material price adjustment, for each Section's asphalt material, is paid under the one Pay Item regardless of the quantity.
- When the Pay Item "Asphalt Material Price Adjustment", is not included, for any section, no payment will be made.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
306.0001.____	ATB	Ton
306.0002.____	Asphalt Binder, Grade PG 52-40V	Ton
306.2001.____	ATB, Price Adjustment, Type ___; Class __	CS
306.2002.____	Asphalt Material Price Adjustment	CS

CR306-040120

DIVISION 400 — ASPHALT PAVEMENTS AND SURFACE TREATMENTS

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Special Provisions

Replace Section 401 with the following:

SECTION 401
HOT MIX ASPHALT PAVEMENT

401-1.01 DESCRIPTION. Construct one or more courses of plant-produced Hot Mix Asphalt (HMA) pavement on an approved surface, to the lines, grades, and depths shown on the Plans.

1. In this Section, HMA refers to Type I, II, III, and IV.

    a. Temporary Asphalt Pavement: HMA, Type II, Class B, minimum.
    b. Preleveling/Leveling Course: HMA, Type IV, Class B.

MATERIALS

401-2.01 ASPHALT BINDER. Conform to Subsection 702-2.01. If binder performance grade is not specified, use PG 52-28.

Provide test reports for each batch of asphalt binder showing conformance to the specifications in Section 702 before delivery to the project. Require that the storage tanks used for each batch be noted on the test report, the anti-strip additives required by the mix design be added during load out for delivery to the project, and a printed weight ticket for anti-strip is included with the asphalt binder weight ticket. The location where anti-strip is added may be changed with the written approval of the Engineer.

Furnish the following documents at delivery:

1. Manufacturer's certificate of compliance (Subsection 106-1.05).
2. Conformance test reports for the batch (provide prior to delivery as noted above).
3. Batch number and storage tanks used.
4. Date and time of load out for delivery.
5. Type, grade, temperature, and quantity of asphalt binder loaded.
6. Type and percent of liquid anti-strip added.

Asphalt binder may be conditionally accepted at the source if a manufacturer's certification of compliance is provided, according to Subsection 106-1.05, and the applicable requirements of Section 702 are met.

401-2.02 LIQUID ANTI-STRIP ADDITIVE. Use anti-strip agents in the proportions determined by ATM 414 and included in the approved Job Mix Design (JMD). At least 90% of the aggregate must remain coated when tested according to ATM 414. The following minimum dose (percent) of liquid anti-strip by weight of asphalt binder is required:

Liquid Anti-strip Type	Minimum Dose by Weight of Asphalt Binder, %
Amines based	0.30
Phosphate Ester based	0.30
Organ-Silane based	0.05

401-2.03 JOINT ADHESIVE. Conform to Subsection 702-2.05.

401-2.04 JOINT SEALANT. Conform to Subsection 702-2.06.

401-2.05 WARM MIX ASPHALT. Conform to Subsection 702-2.07.

401-2.06 ASPHALT RELEASE AGENT. Conform to Subsection 702-2.08.

401-2.07 AGGREGATES. Conform to Subsection 703-2.04. Use a minimum of three stockpiles of crushed aggregate (coarse, intermediate, and fine). Place blend material, if any, in a fourth pile.

401-2.08 RECYCLED ASPHALT PAVEMENT. Recycled asphalt pavement (RAP) may be used in the production of HMA. The RAP may be from pavements removed under the Contract, or from an existing stockpile. Conform to Subsection 703-2.16

401-2.09 JOB MIX DESIGN. Provide target values for gradation that satisfy both the broad band gradation limits shown in Table 703-4 and the requirements of Table 401-1, for the Type and Class of HMA specified.

TABLE 401-1
HMA MARSHALL Design Requirements

DESIGN PARAMETER	CLASS "A"	CLASS "B"
HMA (Including Asphalt Binder)		
Stability, Pounds	1800 Min.	1200 Min.
Flow, 0.01 Inch	8 – 14	8 - 16
Voids in Total Mix (VTM), %	3.0 – 5.0	3.0 – 5.0
Compaction, Number of Blows Each Side of Test Specimen	75	50
Asphalt Binder		
Voids Filled with Asphalt (VFA), %	65 - 75	65 - 78
Asphalt Content, Min. % @ 4% VTM	5.0	5.0
Dust-Asphalt Ratio*	0.6 - 1.4	0.6 - 1.4
Voids in the Mineral Aggregate (VMA), %, Min.		
Type I	12.0	11.0
Type II	13.0	12.0
Type III, IV	14.0	13.0
Liquid Anti-Strip Additive**,%, Min.	0.30	0.30
RAP, %, Max.	15.0	25.0

*Dust-Asphalt ratio is the percent of material passing the No. 200 sieve divided by the percent of effective asphalt binder (calculated by weight).
** By Weight of Asphalt Binder

The approved JMD will specify the Target Values (TV) for gradation, the TV for asphalt binder content, the Maximum Specific Gravity (MSG) of the HMA, the additives, and the recommended mixing temperature range.

Submit the following to the Engineer at least 15 days before the production of HMA:

1. A letter stating the location, size, and type of mixing plant. The letter shall state whether or not WMA and/or RAP will be used. The letter shall include the proposed gradation for the JMD, gradations for individual stockpiles, and the blend ratio of each aggregate stockpile.

2. Representative samples of each aggregate (coarse, intermediate, fine, blend material and mineral filler, if any) in the proposed mix design. Furnish a total of 500 pounds of material in the proportional amounts in the proposed JMD.

3. Five separate 1-gallon samples of the asphalt binder proposed for use in the HMA. Include name of product, manufacturer, test results of the applicable quality requirements of Subsection 702-2.01, manufacturer's certificate of compliance according to Subsection 106-1.05, a temperature- viscosity curve for the asphalt binder or manufacturer's recommended mixing and compaction temperatures, and current Material Safety Data Sheet.

4. One sample, minimum 1/2 pint, of the anti-strip additive proposed, including name of product, manufacturer, and manufacturer's data sheet, and current Material Safety Data Sheet.

5. Testing results per Subsection 106-1.03.1 for each aggregate type proposed for use.

6. If applicable, a letter stating the WMA technology (Subsection 702-2.07) to be used, location where additive will be introduced and manufacturer's recommended usage rate for each type of HMA. Supply a minimum of 2-pint samples for each proposed additive.

7. If applicable, representative samples of any RAP proposed for use. Furnish a minimum of 200-pound sample of proposed RAP.

The Engineer will evaluate the material and the proposed gradation using ATM 417 and the requirements of Table 401-1 for the appropriate Type and Class of HMA specified, and establish the approved JMD which will become a part of the Contract.

Anti-strip evaluation (ATM 414) of HMA mix designs that include RAP will be completed without the inclusion of the RAP.

Obtain an approved JMD prior to shipment of aggregates to an asphalt plant site or producing HMA for payment.

Contractor Mix Design. If a bid item for JMD appears in the contract, or if the Engineer approves a request from the Contractor to perform the JMD at no cost to the Department, provide a JMD following the requirements specified in this section. Submit the JMD to the Engineer at least 15 working days before HMA production. Submit samples to the Engineer upon request for JMD verification testing.

All Contractor-furnished JMDs must be sealed by a professional Engineer registered in the State of Alaska. The Professional Engineer shall certify that the JMD was performed according to the specified procedures, and meets all project specifications.

Changes. Submit a new JMD with changes noted and new samples in the same manner as the original JMD submittal when:

a. The results of the JMD evaluation do not achieve the requirements specified in Table 401-1
b. The asphalt binder source is changed
c. The source of aggregate, aggregate quality or gradation is changed
d. The results of a Test Strip do not meet the requirements of the specification – the Engineer may require a new JMD.

Do not produce HMA for production paving and payment before the Engineer provides written approval of the JMD; the original, or a replacement JMD.

The Engineer has the option to require further verification of the JMD under 401-2.10 Process Quality Control. If a Test Strip(s) is required, do not produce HMA for production paving and payment before the Engineer provides written approval of the Test Strip construction, construction process, materials, and the JMD, Subsection 401-2.10.

Payment for HMA will not be made until the new JMD and the Test Strip, when required, is approved.

Approved changes apply only to HMA produced after the submittal of changes.

The Engineer will assess a fee for each mix design subsequent to the approved Job Mix Design, per Subsection 401-5.01.

401-2.10 PROCESS QUALITY CONTROL. Sample and test materials for quality control of the HMA according to Subsection 106-1.03. Submit to the Engineer at the "Pre-Paving Meeting," Subsection 401-3.01, the JMD and a documentation plan that provides a complete, accurate, and clear record of the sampling and testing results.

Failure to perform quality control forfeits the Contractor's right to a retest under Subsection 401-4.02

Provide copies of the documented sampling and testing results no more than 24 hours from the time taken.

Supplemental Process Quality Control:

The Engineer has the option to require supplemental process quality controls including additional sampling and testing. Include the supplemental process quality controls in the documentation plan.

When directed by the Engineer: provide “Density Profiles” and or “Test Strips”.

1. Density Profiles. Provide density profile testing, with a nuclear density gauge, of the mat and longitudinal joints. Include the frequency of the test groups, configuration of the test groups for mat density and joint density individually or combined. Indicate the number of tests in a test group intended to confirm the density of the mat and joints.

   Locations that may require testing include: all lanes on bridge decks, adjacent to longitudinal joints, areas where segregation is visible, thermal segregation potential exists, where mat density is lower than the minimum (considered segregated), and the paver starts/stops. The Engineer will identify these and other areas that require density testing.

2. Test Strips. Construct test strips (ATM 412) using the approved job mix HMA a minimum of 5 working days prior to planned production paving, except use the proposed JMD when the test strip is being constructed to help evaluate the JMD as part of the mix performance analysis. Submit a proposed test strip location to the Engineer for coordination, and approval; include in the process control documentation plan. The Engineer's approval and written authorization of the location, date, and time, is required before construction of a test strip.

   Establish roller patterns and the number of passes required to assure that proper placement and compaction is achieved. The test strip shall include no less than 300 tons and no more than 1000 tons, except as may be authorized, in writing, by the Engineer. The full complement of the paving train shall be on site to receive instructions from the Engineer as needed to complete the mix performance analysis. Make the equipment available for inspection as required by Subsection 401-3.04. Provide an onsite process control representative with authority to modify mix components as instructed by the Engineer.

   Failed Test Strip: the Engineer may direct the Contractor to remove and dispose of test strips not meeting specification requirements. Contractor, construct a new test strip or return the surface materials and grade to their original condition as directed by the Engineer.

   Only after the Engineer approves the test strip may HMA be produced for production paving and payment.

   Refer to Subsection 401-5.01 for payment of test strips.

CONSTRUCTION REQUIREMENTS

401-3.01 PRE-PAVING MEETING. Meet with the Engineer for a pre-paving meeting in the presence of the project superintendent and paving foreman at least (5) working days before beginning paving operations. Submit a paving plan and pavement inspection plan at the meeting. When directed by the Engineer, make adjustments to the plan and resubmit.

1. Paving Plan. Include the following:

   a. Sequence of operations

   b. List of equipment that will be used for production, transport, pick-up (if applicable), laydown, and compaction

   c. Summary of plant modifications (if applicable) for production of WMA

   d. Procedures to produce consistent HMA

   e. Procedures to minimize material and thermal segregation

   f. Procedures to minimize premature cooling

   g. Procedures to achieve HMA density

h. Procedures for joint construction including corrective action for joints that do not meet surface tolerance requirements

i. Quality control testing methods, frequencies and sample locations for gradation, asphalt binder content, and density, and

J. Any other information or procedures necessary to provide completed HMA construction that meets the Contract Requirements

2. Pavement Inspection Plan. Include the following:

a. Process for daily inspections

b. Means and methods to remove and dispose of project materials

401-3.02 CONTRACTOR QUALITY CONTROL. Perform quality control (QC) of HMA materials in accordance with Subsection 106-1.03.

401-3.03 WEATHER LIMITATIONS. Place HMA on a stable/non-yielding roadbed. Do not place HMA when the base material is wet or frozen, or when weather conditions prevent proper handling or finishing of the mix. Do not place HMA when the roadway surface temperature is colder than 40° F.

401-3.04 EQUIPMENT, GENERAL. Use equipment in good working order and free of HMA buildup. Make all equipment available for inspection and demonstration of operation a minimum of 24 hours before placement of HMA and test strip HMA.

401-3.05 ASPHALT MIXING PLANT. Meet AASHTO M 156. Use an HMA plant capable of producing at least 150 tons of HMA per hour noted on posted DEC air quality permit, designed to dry aggregates, maintain consistent and accurate temperature control, and accurately proportion asphalt binder and aggregates. Calibrate the HMA plant and furnish copies of the calibration data to the Engineer at least 24 hours before HMA production.

Provide a scalping screen at the asphalt plant to prevent oversize material or debris from being incorporated into the HMA.

Provide a tap on the asphalt binder supply line just before it enters the plant (after the 3-way valve) for sampling asphalt binder. Provide aggregate and asphalt binder sampling locations meeting OSHA safety requirements.

You may use belt conveyor scales to proportion plant blends and mixtures if the scales meet the general requirements for weighing equipment and are calibrated according to the manufacturer's instructions.
If WMA is approved by the Engineer, modify the mixing plant as required by the manufacturer and WMA additive manufacturer.

401-3.06 HAULING EQUIPMENT. Haul HMA in trucks with tight, clean, smooth metal beds. Keep beds free of petroleum oils, solvents, or other materials that would adversely affect the mixture. Apply a thin coat of approved asphalt release agent to beds as necessary to prevent mixture adherence. Provide trucks with covers attached and available for use.

When directed by the Engineer, cover the HMA in the hauling vehicle(s).

Do not haul HMA on barges.

401-3.07 ASPHALT PAVERS. Use self-propelled asphalt pavers with heated vibratory screed assemblies to spread and finish HMA to the specified section widths and thicknesses without introducing thermal or material segregation.

Equip the paver with a receiving hopper having sufficient capacity for a uniform spreading operation and a distribution system to place the HMA uniformly in front of screed. Use a screed assembly that produces a finished surface of the required smoothness, thickness, and texture without tearing, shoving, or displacing the HMA. Heat and vibrate screed extensions. Place auger extensions within 20 inches of the screed extensions or per written manufacturer's recommendations.

Equip the paver with a means of preventing segregation of the coarse aggregate particles from the remainder of the HMA when carried from the paver hopper back to the augers.

Equip the paver with automatic screed controls capable of operating from a reference line or a ski from either or both sides of the paver.

The use of a "Layton Box" or equivalent towed paver is allowed on bike paths, sidewalks, and driveways.

401-3.08 ROLLERS. Use both steel-wheel (static or vibratory) and pneumatic-tire rollers. Use rollers designed to compact HMA and capable of reversing without shoving or tearing the mixture. Select rollers that will not crush the aggregate or displace the HMA. Equip vibratory rollers with separate vibration and propulsion controls.

Equip the rollers with an infrared thermometer that measures and displays the surface temperature to the operator. Infrared thermometer may be hand-held or fixed to the roller.

Utilize a pneumatic roller in the complement of rollers to compact the leveling course. Use fully skirted pneumatic-tire roller having a minimum operating weight of 3000 pounds per tire.

401-3.09 RESERVED.

401-3.10 PREPARATION OF EXISTING SURFACE. Prepare existing surfaces according to the Contract. Prior to placing HMA, clean existing surfaces of loose material and uniformly coat contact surfaces of curbing, gutters, manholes and other structures with tack coat material meeting Section 402. Treat cold joint surfaces according to 401-3.17. Allow tack coat to break before placement of HMA on these surfaces. Do not apply the tack coat material until the Engineer approves the existing surface including, not limited to; the existing paved surface, the milled surface, and a prior layer of HMA pavement.

Before applying tack coat to an existing paved surface, clean and patch the surface. Remove irregularities to provide a reasonably smooth and uniform surface. Remove and replace unstable areas with HMA. Clean the edges of existing pavements, which are to be adjacent to new pavement, to permit the adhesion of asphalt materials. Clean loose material from cracks. Fill the cleaned cracks, wider than 1 inch, with HMA tamped in place. Wash and/or sweep the paved surface clean and free of loose materials.

Preparation of a milled surface:

1. Prelevel remaining ruts, pavement delaminations, and depressions having a depth greater than 1/2 inch with an approved HMA.

2. Notify the Engineer of pavement areas that appear thin or unstable. Where milling operation creates thin or unstable pavement areas, or where it breaks through existing pavement, remove thin and unstable pavement, and 2 inches of existing base material, compact and replace with an approved HMA.

401-3.11 PREPARATION OF ASPHALT. Provide a continuous supply of asphalt binder to the asphalt mixing plant at a uniform temperature, within the recommended mixing temperature range.

401-3.12 PREPARATION OF AGGREGATES. Dry the aggregate so the moisture content of the HMA, sampled at the point of acceptance for asphalt binder content, does not exceed 0.5% (by total weight of mix), as determined by ATM 407.

Heat the aggregate for the HMA to a temperature compatible with the mix requirements specified.

Adjust the burner on the dryer to avoid damage to the aggregate and to prevent the presence of unburned fuel on the aggregate. HMA containing soot or fuel is unacceptable per Subsection 105-1.11.

401-3.13 MIXING. Combine the aggregate, asphalt binder, and additives in the mixer in the amounts required by the JMD. Mix to obtain at least 98% coated particles when tested according to AASHTO T195.

For batch plants, put the dry aggregate in motion before addition of asphalt binder.

Mix the HMA within the temperature range determined by the JMD.

Upon the Engineer's request, provide daily burner charts showing start/stop times and temperatures.

401-3.14 TEMPORARY STORAGE OF HMA. Silo type storage bins may be used, provided the characteristics of the HMA remain unaltered.

Signs of visible segregation, heat loss, changes from the JMD, change in the characteristics of asphalt binder, lumpiness, and stiffness of the mixture, are causes for rejection.

Do not store HMA on barges.

401-3.15 PLACING AND SPREADING. Use asphalt pavers to distribute HMA, including leveling course and temporary HMA. Place the HMA upon the approved surface, spread, strike off, and adjust surface irregularities. The maximum compacted lift thickness allowed is 3 inches.

When multiple lifts are specified in the Contract, do not place the final lift until all lower lifts throughout that section, are placed and accepted.

Do not place HMA abutting curb and gutter until curb and gutter are installed, except as approved by the Engineer.

Do not pave against new Portland cement concrete curbing until it has cured for at least 72 hours.

When practicable, adjust elevation of metal fixtures before paving the final lift, so they will be between 1/4 and 1/2 inch below the top surface of the final lift. Metal fixtures include, but are not limited to manholes, valve boxes, monument cases, hand holes, and drains.

When the section of roadway being paved is open to traffic, pave adjacent traffic lanes to the same elevation within 24 hours. Place approved material against the outside pavement edge when the drop off exceeds 2 inches.

Use hand tools to spread, rake, and lute the HMA in areas where irregularities or unavoidable obstacles make mechanical spreading and finishing equipment impracticable.

Place HMA over bridge deck membranes according to Section 508 and the membrane manufacturer's recommendations.

Do not mix HMA produced from different plants for testing or paving.

401-3.16 COMPACTION. Thoroughly and uniformly, compact the HMA by rolling. In areas not accessible to large rollers, compact with mechanical tampers or trench rollers.

Prevent indentation in the mat, do not leave rollers or other equipment standing on HMA that has not sufficiently cooled.

The Lower Specification Limit for density is 92.0% of the Maximum Specific Gravity (MSG) as determined by ATM 409. The MSG from the approved JMD is used for the first lot of each type of HMA. The MSG for additional lots is determined from the first sublot of each lot.

401-3.17 JOINTS. Place and compact the HMA to provide a continuous bond, texture, and smoothness between adjacent sections of the HMA.

Minimize the number of joints. Do not construct longitudinal joints in the driving lanes unless approved by the Engineer in writing at the pre-paving meeting. Offset the longitudinal joints in one layer from the joint in the layer immediately below by at least 6 inches. Align the joints of the top layer at the centerline or lane lines. Where preformed marking tape striping is required, offset the longitudinal joint in the top layer not more than 6 inches from the edge of the stripe.

Form transverse joints by saw-cutting back on the previous run to expose the full depth of the course or by using a removable bulkhead. Skew transverse joints 15 to 25 degrees.

For all joints below the top lift, uniformly coat joint surfaces with tack coat material meeting Section 402.

Uniformly coat the joint face of all top lift joints with a joint adhesive. Follow joint adhesive manufacturer's recommendations for temperatures and application method. Remove joint adhesive applied to the top of pavement surface. If infrared joint heaters are used and passing joint densities are achieved in each of the first three joint densities taken, then joint adhesive is not required.

The Lower Specification Limit for top lift longitudinal joint density is 91.0% of the MSG of the panel completing the joint. MSG will be determined according to ATM 409.

For top lift panels that have a longitudinal joint density less than 91.0% of the MSG in a sublot, seal the surface of the longitudinal joints with joint sealant within that sublot, or as directed.. Apply joint sealant according to the manufacturer’s recommendations while the HMA is clean, free of moisture and prior to final traffic marking. Place the sealant at a maximum application rate of 0.15 gallons per square yard, and at least 12 inches wide centered on the longitudinal joint. After surface sealing, inlay by grinding pavement striping into the sealed HMA. Use grooving equipment that grinds a dry cut to groove the width, length, and thickness of the striping within the specified striping tolerances.

Correct improperly formed joints that result in surface irregularities according to a corrective action plan.

Complete all hot lapped joints while the mat temperature is over 230°F as measured by the Engineer, within 3 inches of the joint. Tack coat and joint adhesive are not required for hot lapped joints. Hot lapped joints will receive the full Longitudinal Joint Density Price Adjustment incentive without testing for joint density.

Top lift longitudinal joints will be evaluated for acceptance according to Subsection 401-4.03

401-3.18 SURFACE REQUIREMENTS AND TOLERANCE. The finished surface of all HMA paving must match dimensions shown in the contract for horizontal alignment and width, profile grade and elevation, crown slope, and pavement thickness. Water must drain across the pavement surface without ponding. The surface must have a uniform texture, without ridges, puddles, humps, depressions, and roller marks. The surface must not exhibit raveling, cracking, tearing, asphalt bleeding, or aggregate segregation. Leave no foreign material, uncoated aggregate, or oversize aggregate on the HMA surface.

The Engineer will test the finished surface after final rolling at selected locations using a 10-foot straightedge. The Engineer will identify pavement areas that deviate more than 3/16 inch from the straightedge, including joints, as defective work. Perform corrective work by removing and replacing, grinding, cold milling or infrared heating such areas as required. Do not surface patch. After the Contractor performs corrective work, the Engineer will retest the area.

The Engineer will use an inertial profiler to measure the top lift HMA surface in the driving lanes for surface smoothness within 21 days after paving is complete and driving lanes are delineated.

Profiler measurements will not be taken in turn lanes, ramps, lane transitions, or within 25 feet of bridge abutments and transverse joints with pre-existing pavement.

The Engineer will measure the pavement smoothness in both wheel paths of each lane. The smoothness is measured as International Roughness Index (IRI), reported as inches/mile, at 0.1-mile increments. Pavement smoothness is the average of all IRI measurements for the project.

The Engineer will identify areas requiring corrective action in accordance with Table 401-4. Perform full-width corrective action in those areas. The Engineer may waive corrective work for localized roughness for deficiencies resulting from manholes or other similar appurtenances near the wheel path.

Perform Corrective Actions according to one of the following or by a method approved by the Engineer:

1. Diamond Grinding. If the required pavement thickness is not decreased by more than 0.25", grind to the required surface tolerance and cross section. Remove and dispose of all waste materials. Apply joint sealant and sand to exposed aggregates per the manufacturer's recommendations.

2. Overlaying. Mill or sawcut the existing pavement to provide a vertical transverse joint face to match the overlay to the existing pavement. Apply tack coat on the milled surface and joint adhesive to all vertical joints and overlay the full width of the underlying pavement surface. Use the same approved HMA for overlays. Place a minimum overlay thickness of 2.0 inches.

3. Mill and Fill. Mill the existing pavement to provide a vertical transverse joint face. Apply tack coat to the milled surface and joint adhesive to all vertical joints prior to inlaying new HMA to match the existing pavement. Use the same approved HMA. Place a minimum thickness of 2.0 inches.

After completion of corrective work, the Engineer will measure the pavement surface with an inertial profiler for a smoothness price adjustment.

Price adjustments for pavement smoothness will be calculated according to Subsection 401-4.03.3.

401-3.19 REPAIRING DEFECTIVE AREAS. Remove HMA that is contaminated with foreign material, is segregated (determined visually or by testing), flushing, or bleeding asphalt. Remove and dispose defective HMA for the full thickness of the course. Cut the pavement so that edges are vertical and the sides are parallel to the direction of traffic. Coat edges with a tack coat according to Section 402. Place and compact fresh HMA so that compaction, grade, and smoothness requirements are met.

401-3.20 ROADWAY MAINTENANCE. Inspect daily according to pavement inspection plan. Remove, and dispose of project materials incorrectly deposited on existing and new pavement surfaces(s) inside and outside the project area including haul routes.
The Contractor is responsible for damage caused by not removing these materials and any damage to the roadway from the removal method(s).

Repair damage to the existing roadway that results from fugitive materials or their removal.

401-4.01 METHOD OF MEASUREMENT. Section 109 and the following:

1. Hot Mix Asphalt.

   a. By weight. No deduction is made for the weight of asphalt binder or anti stripping additive or cutting back joints. If the use of WMA is approved by the Engineer, WMA additives will not be measured and are considered subsidiary to the HMA pay item.

   b. By the final HMA surface area.

2. Asphalt Binder. By weight, as follows:

   Method 1 will be used for determining asphalt binder quantity unless otherwise directed in writing. The procedure initially used will be the one used for the duration of the project. No payment is made for any asphalt binder more than 0.4% above the optimum asphalt binder content specified in the JMD.

Method 1: Percent of asphalt binder for each sublot multiplied by the total HMA weight represented by that sublot. The Engineer will use either ATM 405 or ATM 406 to determine the percent of asphalt binder. The same test method used for the acceptance testing of the sublot will be used for computation of the asphalt binder quantity. In the absence of testing, the percent of asphalt binder is the target value for asphalt binder in the JMD.

Method 2: Supplier's invoices minus waste, diversion, and remnant. This procedure is an Engineer's option for projects where deliveries are made in tankers and the asphalt plant is producing HMA for one project only.

The Engineer may direct, at any time that tankers are weighed in the Engineer's presence before and after unloading. If the weight determined at the project varies more than 1% from the invoice amount, payment is based on the weight determined at the project.

Any remnant or diversion will be calculated based on tank stickings or weighing the remaining asphalt binder. The Engineer will determine the method. The weight of asphalt binder in waste HMA is calculated using the target value for asphalt binder as specified in the JMD.

3. Job Mix Design. When specified, a Contractor furnished JMD is measured as one according to the HMA class and type.

4. Temporary Pavement. By weight, without deduction for the weight of asphalt binder or anti-strip additive.

5. Leveling Course. By Lane-Station (12 foot width) or by weighing without deduction for the weight of asphalt binder or anti-strip additive.

6. HMA Price Adjustment. Calculated by quality level analysis under Subsection 401-4.03.1.

7. Longitudinal Joint Density Price Adjustment. By the linear foot of top lift longitudinal joint under Subsection 401-4.03.2.

8. Joint Adhesive. By the linear foot of longitudinal and transverse joint.

9. Pavement Smoothness Price Adjustment. Calculated from inertial profiler data using FHWA's ProVAL software under Subsection 401-4.03.3.

10. Asphalt Material Price Adjustment. Determined under Subsection 401-4.04.

11. Liquid Anti-Strip Additive. Based on the number of tons of asphalt binder containing required additive.

12. Crack Repair. From end to end of the crack repaired according to 401-3.10, measured horizontally along the centerline of the crack.

13. Prelevel for Ruts, Delaminations, and Depressions. By the surface area where prelevel is placed according to 401-3.10(1), measured according to Section 109.

14. Repair Unstable Pavement. By the surface area of pavement repaired according to 401-3.10(2), measured according to Section 109.

401-4.02 ACCEPTANCE SAMPLING AND TESTING.

1. Hot Mix Asphalt

The bid quantity of each type of HMA produced and placed is divided into lots and the lots evaluated individually for acceptance.

A lot is normally 5,000 tons. The lot is divided into sublots of 500 tons, each randomly sampled and tested for asphalt binder content, density, and gradation according to this Subsection. The lot is evaluated for price adjustment according to Subsection 401-4.03.1. Seasonal startup or a new JMD requires starting a new lot.

If less than 8 sublots have been placed at the time a lot is terminated, the material in the shortened lot will be included as part of the prior lot. The price adjustment computed for the prior lot will include the samples from the shortened lot. Density test results from material in the shortened lot will be based on the MSG of the first sublot of the shortened lot. If there is no prior lot, and there are at least 3 sublots, the material in the shortened lot will be considered as a lot and the price adjustment will be based on the actual number of test results in the shortened lot. If there are less than 3 sublots, the HMA will be accepted for payment based on the Engineer's approval of the JMD, and placement and compaction of the HMA to the specified depth, finished surface requirements, and tolerances.

If 8 or 9 sublots have been placed at the time a lot is terminated, they will be considered as a lot and the price adjustment will be based on the actual number of test results in the shortened lot.

If the bid quantity is between 1,500 to 5,000 tons, the quantity is considered one lot. The lot is divided into sublots of 500 tons, each randomly sampled and tested for asphalt binder content, density, and gradation according to this Subsection.

For bid quantity less than 1,500 tons, HMA will be accepted for payment based on the Engineer's approval of the JMD, and placement and compaction of the HMA to the specified depth, finished surface requirements, and tolerances.

The Engineer reserves the right to perform any testing required in order to determine acceptance.

a. Asphalt Binder Content. HMA samples shall be taken randomly by the Contractor in the presence of the Engineer from behind the paver screed before initial compaction, or will be taken randomly by the Engineer from the windrow, according to ATM 402 or ATM 403, at the discretion of the Engineer. The location (behind the paver screed or windrow) will be determined at the pre-paving meeting. The Engineer will determine random sampling locations.

Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if requested. At the discretion of the Engineer, Asphalt binder content will be determined according to ATM 405 or ATM 406.

b. Aggregate Gradation. Aggregates tested for gradation acceptance will have the full tolerances from Table 401-2 applied.

(1). Drum Mix Plants. Samples will be taken from the combined aggregate cold feed conveyor via a diverter device, from the stopped conveyor belt or from the same location as samples for determination of asphalt binder content, at the discretion of the Engineer. Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if requested. The aggregate gradation for samples from the conveyer system will be determined according to ATM 304. For HMA samples, the gradation will be determined according to ATM 408 from the aggregate remaining after the ignition oven (ATM 406) has burned off the asphalt binder. Locate diverter devices for obtaining aggregate samples from drum mix plants on the conveyor system delivering combined aggregates into the drum. Divert aggregate from the full width of the conveyor system and maintain the diverter device to provide a representative sample of aggregate incorporated into the HMA.

(2) Batch Plants. Samples will be taken from dry batched aggregates according to ATM 301 or from the same location as samples for determination of asphalt binder content, at the discretion of the Engineer. Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if requested. The aggregate gradation for dry batch samples will be determined according to ATM 304. For HMA samples, the gradation will be determined according to ATM 408 from the aggregate remaining after the ignition oven (ATM 406) has burned off the asphalt binder.

c. Density. The Engineer will determine and mark the location(s) where the Contractor takes each core sample.

(1) Mat Cores: The location(s) for taking core samples is determined using a set of random numbers (independent of asphalt binder and aggregate sampling set of random numbers) and the Engineer's judgment. Take no mat cores within 1 foot of a joint or edge. Core samples are not taken on bridge decks.

(2) Longitudinal Joint Cores: The Engineer will mark the location(s) to take the core sample, centered on the visible surface joint, and adjacent to the mat core sample taken in the panel completing the joint.

Take core samples according to ATM 413 in the presence of the Engineer. Cut full depth core samples, centered on the marks and as noted above, from the finished HMA within 24 hours after final rolling. Neatly core drill one six-inch diameter sample at each marked location. Use a core extractor to remove the core - do not damage the core. The Engineer will immediately take possession of the samples. Backfill and compact voids left by coring with new HMA within 24 hours, and according to ATM 413. The Engineer will determine density of samples according to ATM 410.

d. Asphalt binder Content, Aggregate Gradation, and Density - Retest. When test results have failed to meet specifications, retest of acceptance test results for asphalt binder content, gradation, and density may be requested provided the quality control requirements of Subsection 401-3.02 Contractor Quality Control are met. Deliver this request in writing to the Engineer within 7 days of receipt of the final test of the lot. The Engineer will mark the sample location for the density retest within a 2-foot radius of the original core. The original test results are discarded and the retest result is used in the price adjustment calculation regardless of whether the retest result gives a higher or lower pay factor. Only one retest per sample is allowed. When gradation and asphalt binder content are determined from the same sample, a request for a retest of either gradation or asphalt binder content results in a retest of both. Both gradation and asphalt binder content retest results are used in the price adjustment calculation. Except for the first lot, retesting for gradation or asphalt binder from the first sublot of a lot will include retesting for the MSG. Retesting will be performed by the Department's regional laboratory.

2. Asphalt Binder

The bid quantity of asphalt binder produced and placed is divided into lots and the lots evaluated individually for binder grade acceptance.

Testing will be by AASHTO accredited independent laboratories. When retesting is requested, the assigned value (ATV) will be determined using ASTM D3244. Each test will be completed by a different laboratory.

a. Acceptance Test. The lot size for asphalt binder is 200 tons. If a project has more than one lot and the remaining asphalt binder quantity is less than 150 tons, it is added to the previous lot and that total quantity will be evaluated as one lot. If the remaining asphalt binder quantity is 150 tons or greater, it is sampled, tested and evaluated as a separate lot.

If the bid quantity of asphalt binder is between 85 to 200 tons, the quantity is considered as one lot and sampled, tested, and evaluated according to this subsection. Quantities of asphalt binder less than 85 tons will be accepted based on manufacturer’s certified test reports and certification of compliance.

Sample asphalt binder at the plant from the supply line in the presence of the Engineer according to ATM 401. The Engineer will take immediate possession of the samples. Take three samples from each lot, one for acceptance testing, one for Contractor requested retesting, and one held in reserve for referee testing if requested. Meet Subsection 702-2.01 requirements for asphalt binder quality.

b. Retest. Submit a written request, for a retest, no more than 7 days from receiving notice of the failed acceptance test. In the request, identify the retest laboratory. The Engineer will send the second sample (retest sample) to the laboratory. Provide the retest results to the Engineer. Contractor pays for the retest costs.

   If the average of the combined test results ([acceptance + retest]/2) passes the specification requirement, the average value becomes the ATV. If this ATV fails the specification requirement, the Engineer or Contractor may request the third sample (referee sample) be tested.

d. Referee Test. The Engineer will send the third sample (referee sample) to an agreed upon laboratory. The average of the combined test results ([acceptance + retest + referee]/3) equals the ATV. If the ATV fails to meet specifications, the Contractor pays for the referee test.

401-4.03 EVALUATION OF MATERIALS FOR ACCEPTANCE. The Engineer may reject material which appears to be defective based on visual inspection. If a test of rejected material is requested, a minimum of two samples are collected from the rejected material and tested. If all test results are within specification limits, payment for the material is made.

The following methods are applied to each type of HMA with Price Adjustment Pay Items in the Contract. These methods describe how price adjustments are determined based on the quality of the HMA binder longitudinal joint density and pavement smoothness.

1. HMA Price Adjustment. Acceptance test results for HMA asphalt binder content, gradation and mat density are used in HMA price adjustment. These test results for a lot are analyzed collectively and statistically by the Quality Level Analysis (QLA) method as specified in Subsection 106-1.03.3 to determine the total estimated percentage of the lot that is within specification limits. The values for percent passing the #200 sieve, asphalt binder content and density test results are reported to the nearest 0.1 percent. All other sieves used in QLA are reported to the nearest whole number.

   The HMA price adjustment is based on the lower of two pay factors. The first factor is a composite pay factor (CPF) for HMA that includes gradation and asphalt binder content. The second is the density pay factor (DPF).

   A lot containing material with less than a 1.000 pay factor is accepted at an adjusted price, provided that pay factor is at least 0.800 and there are no isolated defects identified by the Engineer. A lot containing material that fails to obtain the minimum pay factor is considered unacceptable and rejected under Subsection 105-1.11.

   HMA pay factors are computed as follows:

   a. All statistical Quality Level Analysis (QLA) is computed using the Engineer's Price Adjustment programs.

   b. The USL and LSL are equal to the Target Value (TV) plus and minus the allowable tolerances in Table 401-2, or as shown below. The TV is the specification value shown in the approved Job Mix Design.

TABLE 401-2
HMA LOWER SPECIFICATION LIMIT (LSL) & UPPER SPECIFICATION LIMIT (USL)

Measured Characteristics	LSL	USL
3/4-inch or largest sieve size	99	100
1/2-inch sieve or first sieve retaining aggregate	TV -6	TV +6
3/8-inch sieve	TV -6	TV +6
No. 4 sieve	TV -6	TV +6
No. 8 sieve	TV -6	TV +6
No. 16 sieve	TV -5	TV +5
No. 30 sieve	TV -4	TV +4
No. 50 sieve	TV -4	TV +4
No. 100 sieve	TV -3	TV +3
No. 200 sieve*	TV -2.0	TV +2.0
Asphalt Binder Content, %	TV -0.4	TV +0.4
Mat Density, %	92.0	100.0

*LSL for the No. 200 sieve is restricted by the broadband limits in Table 703-4.

c. The percent within limits (PWL), Quality Levels and characteristic pay factors (PFs) are determined by the Engineer for each Lot in accordance with Subsection 106-1.03.3. The Composite Pay Factor (CPF) for the lot is determined from gradation and asphalt binder content (ac) acceptance test results using the following example formula:

$$CPF = \frac{[f_{3/4\ inch}\ (PF_{3/4\ inch}) + f_{1/2\ inch}\ (PF_{1/2\ inch}) + \ldots . f_{ac}\ (PF_{ac})]}{\Sigma f}$$

Table 401-3 gives the weight factor (f) for each test property considered.

TABLE 401-3
WEIGHT FACTORS

Property	Type I Factor "f"	Type II Factor "f"	Type III Factor "f"
1-inch sieve	4	-	-
3/4-inch sieve	4	4	-
1/2-inch sieve	4	5	4
3/8-inch sieve	4	5	5
No. 4 sieve	4	4	5
No. 8 sieve	4	4	5
No. 16 sieve	4	4	5
No. 30 sieve	4	5	6
No. 50 sieve	4	5	6
No. 100 sieve	4	4	4
No. 200 sieve*	20	20	20
Asphalt Content, %	40	40	40

The Density Pay Factor (DPF) is computed using HMA mat core compaction acceptance test results.

The CPF and DPF are rounded to the nearest 0.001. The price adjustment for each individual lot is calculated as follows:

HMA Price Adjustment = [(CPF or DPF)* -1.000] x (tons in lot) x (PAB)

* CPF or DPF, whichever is lower

PAB = Price Adjustment Base = $110.00 per ton.

The HMA Price Adjustment is the sum of the price adjustments for each lot and paid for under Item 401.0008.____.

2. Longitudinal Joint Density Price Adjustment. Longitudinal joint density price adjustment will be based on the project average of all top lift cold joint densities and determined as follows:

   a. Disincentive. Project average top lift joint density less than 91.0% MSG:

      Deduct $3.00 per lineal foot.

   b. Incentive. Project average top lift joint density greater than:

      92.0% MSG. Add $0.50 per lineal foot
      93.0% MSG. Add $1.00 per lineal foot
      94.0% MSG. Add $1.50 per lineal foot

   The longitudinal Joint Density Price Adjustment is the total price adjustment paid for under Item 401.0009.____.

3. Pavement Smoothness Price Adjustment. Pavement smoothness will be measured by the Engineer and reported as IRI (inches/mile), according to Subsection 401-3.18. Incentive for pavement smoothness shall apply only if both the project average CPF and DPF are greater than or equal to 1.000. Disincentive for pavement smoothness shall apply regardless of the project average CPF or DPF.

   The Engineer will calculate the pavement smoothness price adjustment according to Method 1 (pavement placed over graded subgrade), and/or Method 2 (pavement placed over existing pavement). The SF is rounded to the nearest 0.001.

   Method 1: SPA = PAB x PQ x SF,

   where:

   SPA = Pavement Smoothness Price Adjustment

   PAB = $110.00 per ton,

   PQ = Top layer HMA quantity, tons

   SF = Smoothness Factor (Table 401-4)

TABLE 401-4
SMOOTHNESS FACTOR (SF)

IRI (in./mile)	SF
Less than 40.0	0.050
40.0 to 70.0	0.050 – (IRI – 40.0)/600.0
70.0 to 90.0	0.000
90.0 to 120.0	(90.0 – IRI)/120.0
Greater than 120.0*	-

* Corrective Work required, see Subsection 401-3.18

   Method 2: SPA = PAB x PQ x SF,

   Where:

   SPA = Pavement Smoothness Price Adjustment

   PAB = $110.00 per ton,

PQ = Top layer HMA quantity, tons

SF = Smoothness Factor = 0.120 x RR – 0.020; SF not to exceed 0.050

RR = Roughness Reduction = (Initial IRI – Final IRI) / Initial IRI

Initial IRI = Pre-project average IRI as measured and reported by the Engineer. The Initial IRI will either be included in the bid documents or the timeline for when the Initial IRI will be measured will be identified in the bid documents.

Final IRI = Top layer HMA average IRI as measured and reported by the Engineer according to Subsection 401-3.18.

The Pavement Smoothness Price Adjustment is the total price adjustment paid for under Item 401.2010.____.

4. Asphalt Binder Price Adjustment. A lot quantity of asphalt binder, with a pay factor less than 1.00, is accepted or rejected per Table 401-3.01-1 Asphalt Binder Pay Factors.

TABLE 401-4.03-1
ASPHALT BINDER PAY FACTORS

Pay Factor			1.01	1.00	0.95	0.90	0.75	Reject
RTFO (Rolling Thin Film Oven)								
DSR[(a.1)]	All Grades	G*/Sinδ, kPa^{-1}	≥ 2.69	2.68–2.20	2.19–1.96	1.95–1.43	1.42–1.10	< 1.10
MSCR[(a.2)]	PG 52-40 V	$J_{NR\ 3.2}$	≤ 0.39	0.40–0.50	0.51–0.59	0.60–0.69	0.70–1.00	> 1.00
		% $Rec_{3.2}$	≥ 86.0	85.9–75.0	74.9–68.0	67.9–60.0	59.9–55.0	< 55.0
	PG 58-34 E	$J_{NR\ 3.2}$	≤ 0.19	0.20–0.25	0.26–0.29	0.30–0.39	0.40–0.50	> 0.50
		% $Rec_{3.2}$	≥ 90.0	89.9–85.0	84.9–80.0	79.9–75.0	74.9–70.0	< 70.0
	PG 64-40 E	$J_{NR\ 3.2}$	< 0.05	0.05–0.10	0.11–0.15	0.16–0.20	0.21–0.25	> 0.25
		% $Rec_{3.2}$	≥ 97.0	96.9–95.0	94.9–91.0	90.9–85.0	84.9 – 80.0	< 80.0
PAV (Pressurized Aging Vessel)								
DS[(a.3)]	PG 64-40 E & All Other Grades	G*Sinδ, kPa	≤ 4711	4712–5000	5001–5289	5290–5578	5579–5867	> 5867
	PG 52-40 V, PG 58-34 E	G*Sinδ, kPa	≤ 5700	5701–6000	6001–6300	6301–6600	6601 – 7000	> 7000
CS[(a.4 & 5)]	All Grades[(a.4)]	BBR, *S*, MPa	≤ 247	248–300	301–338	339–388	389–449	≥ 450
	All Grades[(a.5)]	BBR, *m*	≥ 0.320	0.319–0.300	0.299–0.294	0.293–0.278	0.277–0.261	< 0.261

Creep Stiffness (CS) Dynamic Shear (DS) Multiple Stress Creep Recovery (MSCR)

a. Asphalt Binder Pay Adjustment = (Lowest Pay Factor – 1.00) x (tons in lot) x PAB x 5

Select the lowest pay factor from:

RTFO (test the binder residue at the performance grade temperature)
(1) DS, All Grades, G*/Sinδ, kPa^{-1}
(2) MSCR: PG, Select the highest pay factor corresponding to, either $J_{NR\ 3.2}$ or % $Rec_{3.2}$ values

PAV
(3) DS, PG, G*Sinδ, kPa
(4) CS, All Grades, BBR, *S* MPa
(5) CS, All Grades, BBR, *m*

b. If three consecutive acceptance samples are out of specification, stop HMA production immediately and submit a corrective action plan to the Engineer for approval.

The Asphalt Binder Price Adjustment is the sum of the price adjustments for each lot and paid for under Item 401.2021.____.

401-4.04 ASPHALT MATERIAL PRICE ADJUSTMENT. Asphalt Material Price Adjustment. This subsection provides a price adjustment for asphalt material by: (1) additional compensation to the contractor or (2) a deduction from the contract amount.

1. This provision shall apply:

   a. To asphalt material meeting the criteria of Subsection 702-2.01 Asphalt Binder, and is included in items listed in the bid schedule of Sections 306, 307, 308, 318, 401 thru 405, 408, 520, 608 and 609.

   b. To cost changes in asphalt material that occur between the date of bid opening and the date on the certified bill of lading from the asphalt material refiner/producer.

   c. When there is more than a seven and one half percent (7.5%) increase or decrease in the Alaska Asphalt Material Price Index, AAMPI, from the date of bid opening to the date on the certified bill of lading from the asphalt refiner/producer.

2. Provide the certified bill of lading from the asphalt material refiner/producer.

3. The AAMPI is calculated bimonthly on the first and third Friday of each month, and will remain in effect from the day of calculation until the next bimonthly calculation. The AAMPI is posted on the Department's Statewide Materials website at and calculated according to the formula posted there. http://www.dot.state.ak.us/stwddes/desmaterials/aprice_index.shtml

4. Price adjustment will be cumulative and calculated with each progress payment. Use the AAMPI in effect on the date of the certified bill of lading from the asphalt material refiner/producer, to calculate the price adjustment for asphalt material The Department will increase or decrease payment under this contract by the amount determined with the following asphalt material price adjustment formula:

   For an increase exceeding 7.5%, additional compensation = [(IPP – IB) – (0.075 x IB)] x Q

   For a decrease exceeding 7.5%, deduction from contract = [(IB – IPP) – (0.075 x IB)] x Q
   Where:

   Q = Quantity of Asphalt Material incorporated into project, in tons as measured by the Engineer

   IB = Index at Bid: the Bi-monthly AAMPI in effect on date of bid, in dollars per ton

   IPP = Index at Pay Period: The bi-monthly AAMPI in effect on the date shown on the certified bill of lading from the asphalt refiner/producer, in dollars per ton

5. Method of measurement for determining Q (quantity) is the weight of asphalt material that meets the criteria of this subsection and is incorporated into the project. The quantity does not include aggregate, mineral filler, blotter material, thinning agents added after material qualification, or water for emulsified asphalt. The quantity for emulsified asphalts will be based on the asphalt residue material only and will be calculated using the percent residue from testing, or if not tested, from the manufacturer's certificate of compliance.

401-5.01 BASIS OF PAYMENT.

The following items, unless included as individual Pay Items, are subsidiary to the Section 401 Hot Mix Asphalt Pavement related Pay Items as included in the bid schedule:

- Asphalt binder
- Liquid anti-strip additives
- Tack coat
- Crack sealing

- Crack repair
- Joint adhesive
- Surface sealing of longitudinal joints
- Surface tolerance corrections
- Patching defective areas
- Prelevel for ruts, delaminations, and depressions
- Repair unstable pavement
- Job mix design
- Density profiles, Subsection 401-2.10 Process Quality Control
- Repair work and materials when planing equipment breaks through existing pavement – Subsection 401-3.10 Preparation of Existing Surface
- Work and materials associated with Subsection 401-3.06 Hauling Equipment
- Work and materials associated with Subsection 401-3.20 Roadway Maintenance

Test Strips: Subsection 401-2.10 Process Quality Control.

a. Approved. Test strip construction and material, approved by the Engineer in writing, as meeting the specification requirements will be paid for at the Contract unit prices for HMA and asphalt binder as included in the Bid Schedule. Price adjustments 401.0008.____, 401.009.____, 401.0010.____ and 401.2021.____ do not apply.

b. Failed. The materials, construction of, removal and disposal of a failed test strip will be at the Contractor's expense.

Item 401.0005.____ HMA, Temporary, Type ___; Class ___. Removal and disposal of temporary HMA is subsidiary.

The following price adjustment Pay Items, unless included as individual Pay Items in the bid schedule, are paid under 401.2022.____ Combined Price Adjustment.

401.0008.____ HMA Price Adjustment, Type __; Class __,
401.0009.____ Longitudinal Joint Density Price Adjustment,
401.0010.____ Pavement Smoothness Price Adjustment, Method __.
401.2021.____ Asphalt Binder Price Adjustment

Item 401.0008.____ HMA Price Adjustment, Type __; Class __, is the sum of the price adjustments for each material lot, and for deductions and fees assessed. Deductions and fees assessed include:

- Each mix design subsequent to the approved JMD for each type and class of HMA specified will result in a fee of $6000.
- Failure to cut core samples within the specified period will result in a deduction of $100 per sample per day.
- Failure to backfill voids left by sampling within the specified period will result in a deduction of $100 per hole per day.
- If an asphalt binder referee test is requested and the ATV confirms the asphalt binder does not meet Contract requirements, a fee of $500 will be assessed.

Items 401.0008.____ HMA Price Adjustment, Type___; Class___, and 401.2022.____ Combined Price Adjustment do not apply to the following:

- HMA contract quantity is less than 1500 tons.
- HMA leveling course and rut repair.
- Temporary HMA.
- Driveway and approach HMA.

Item 401.0015.____ Asphalt Material Price Adjustment.

For each Section as included in Subsection 401-4.04 Asphalt Material Price Adjustment, item 1.a, the "Asphalt Material Price Adjustment" is paid under the asphalt material Pay Item for the Section with the greatest quantity as determined by the estimate of quantities included in the Plans at the time of the bid opening.

- When more than one "Asphalt Material Price Adjustment" Pay Item is included in the Plans or bid schedule the asphalt material price adjustment, for each Section's asphalt material, is paid under the Pay Item with the greatest quantity.
- When more than one asphalt material is included in the project and only one "Asphalt Material Price Adjustment" Pay Item is included in the Plans or bid schedule, the asphalt material price adjustment, for each Section's asphalt material, is paid under the one Pay Item regardless of the quantity.
- When the Pay Item "Asphalt Material Price Adjustment," is not included, for any section, no payment will be made.

Item 401.0016.____ Crack Repair. Cleaning loose material from cracks, asphalt binder, and HMA to fill cracks are subsidiary.

Item 401.0017.____ Prelevel for Ruts, Delaminations, and Depressions. Cleaning loose material, asphalt binder, and HMA are subsidiary.

Item 401.0018.____ Repair Unstable Pavement. Removal of pavement and base course, asphalt binder, and HMA are subsidiary.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
401.0001.____	HMA, Type __; Class __	Ton
401.0002.____	HMA, Leveling Course, Type IV; Class B	LnSt
401.0003.____	HMA, Leveling Course, Type IV; Class B	Ton
401.0004.____	Asphalt Binder, Grade PG 52-40V	Ton
401.0005.____	HMA, Temporary, Type II, Class B	Ton
401.0006.____	HMA, Type __, Class __	SY
401.0007.____	Liquid Anti-Strip Additives	CS
401.0013.____	Job Mix Design	Each
401.0014.____	Joint Adhesive	LF
401.0015.____	Asphalt Material Price Adjustment	CS
401.0016.____	Crack Repair	LF
401.0017.____	Prelevel for Ruts, Delaminations, and Depressions	SY
401.0018.____	Repair Unstable Pavements	SY
401.2022.____	Combined Price Adjustment	CS

CR401-040120

Special Provision

Replace Section 406 with the following:

SECTION 406
RUMBLE STRIPS

406-1.01 DESCRIPTION. Form a series of indentations (rumble strips) into the roadway pavement. Place rumble strips in each shoulder and the roadway centerline to the width, depth, and length as indicated in the Contract documents and/or as directed by the Engineer.

406-1.02 RUMBLE STRIP. A single uniform circular concave (cross section) indentation/depression milled into the pavement surface having a length measured perpendicular to the direction of travel, a width measured in the direction of travel and a depth measured from the surface of the pavement to the bottom of the indentation.

406-2.01 MATERIALS. None.

406-2.02 MILLING EQUIPMENT. Use equipment designed specifically for milling rumble strips into asphalt pavement. Equip milling machine with a rotary type cutting head with a maximum outside diameter of 24-inches and a minimum length of 16-inches capable of producing a depression both 12-inches and 16-inches in length by 7 1/2-inches in width to a depth shown in the Plans. Arrange the cutting tips to provide a smooth cut (approximately 1/16-inch between peaks and valleys).

Furnish the milling equipment with a guidance system, including a guide, clearly visible to the operator, to provide for consistent alignment of each rumble strip cut at the offsets from traveled way indicated on the Plans and to provide uniformity and consistency throughout the project. The equipment shall incorporate water into the cutting head to minimize dust caused by the milling operation.

Equipment Manufacture: provide training for the operators and a representative onsite during installation of the rumble strip test section(s) (Subsection 406-3.03). Representative: remain onsite until test specimen(s) satisfy the Plans and Specifications as determined by the Engineer.

CONSTRUCTION REQUIREMENTS

406-3.01 PAVEMENT SURFACE PREPARATION. Inspect roadway to receive rumble strips for acceptable pavement condition and stake locations to receive rumble strips prior to installation. Prepare the roadway for the milling operation by providing a smooth clean surface. Sweep all loose material from the roadway surface in line with the planned rumble strips and to each side of the strips for the width of the milling machine plus an additional 12” minimum per side or edge of pavement whichever is smaller, and as directed by the Engineer.

Sweep and broom as noted and with the equipment indicated in Subsection 643-3.04, No. 6, Sweeping and Power Brooming.

406-3.02 TOLERANCES FOR RUMBLE STRIPS.

1. Length: ± 1/2-inch.
2. Width: ± 1/2-inch.
3. Depth: ± 1/16-inch.
4. Spacing: ± 1/2-inch.
5. Alignment: ± 1-inch from the striping layout in the Plans; existing striping and re-established striping.

If it is determined that the rumble strips are not being placed to specification, make immediate adjustments to correct the problem.

Rumble strips are unacceptable if:

1. The strips are not straight.
2. The length or width does not meet tolerance.
3. The depth of the depression does not meet tolerance.
4. The depression/indentation concave surface is not smooth, does not meet tolerance.
5. The edge of the indentation/depression is not straight, smooth, and free of spalling.
6. Pavement surface is damaged as a result of improper rumble strip installation.

Unacceptable rumble strip installation, dimensional, alignment, surface irregularities, and surface damage shall be ground, resurfaced and the rumble strip reinstalled to the satisfaction of the Engineer and at the Contractor's expense. Perform repairs using equipment similar to the equipment initially used to mill the rumble strip. Do not perform repairs in a "patch work" manner. If more than one repair is required; in a group of rumble strips repair the entire group. Where a repair is required in a continuous run, repair the unacceptable rumble strip(s) and repair or replace the rumble strip to each side of the unacceptable rumble strip as required to provide continuity between rumble strips as originally intended. The Engineer will confirm the extent of the repair(s) required.

If during production the work becomes unacceptable the Engineer may require resumption of testing, Subsection 406-3.03. Testing in addition to the initial test for each rumble strip type will be at the Contractor's expense.

406-3.03 RUMBLE STRIP TEST SECTION. Install an initial 1/4 mile test section for each of the following rumble strip type(s):

1. Shoulder.

Demonstrate for each type of rumble strip that the equipment and method will provide the desired milled-in rumble strip, including the surface inside each depression, without damaging the surrounding asphalt pavement. If any of the initial test sections do not meet tolerances, provide new equipment, new method, or make necessary adjustments and retest. These additional test sections will be required before production runs will be allowed to begin.

Testing in addition to the initial test sections, one for the shoulder type and one for the centerline type, will be at the Contractor's expense.

Additionally, demonstrate the means and methods, including the equipment, for containing dust and waste material.

406-3.04 TRAFFIC STRIPING RE-ESTABLISHMENT. Traffic striping is required to provide guidance for the rumble strip installation operation. Contractor, where shoulder and/or centerline striping is missing to the extent that rumble strip location cannot be determined by the Engineer, re-establish the striping location prior to the milling operation. Re-establish missing striping location by measuring laterally across the roadway from adjacent visible striping. Maintain the same lane widths that exist at each end of the missing striping. Provide sufficient location marking or "rabbit tracks" to ensure an accurate milling operation. Shoulder re-striping is not required. Re-establishing roadway striping location will not be measured or paid for separately but will be subsidiary to the respective rumble strip pay items.

406-3.05 RUMBLE STRIP INSTALLATION. Install the following types of rumble strip at the locations shown in the Plans:

1. Shoulder. Do not disturb existing shoulder striping.

In compacted pavement with a temperature below 80˚ F, mill each type of rumble strip to the dimensions shown in the Plans. Locate the inside edge of the rumble strip as shown in the Plans. The Engineer will randomly check the edge alignment of the milled pattern.

406-3.06 CLEAN UP OF MILLINGS. Handle, transport, and store, or dispose of material according to the Alaska Department of Environmental Conservation (DEC) regulations. Remove off the project, on a daily basis, waste material (millings) resulting from the operation.

Disposal: Dispose waste material outside the project limits, unless directed otherwise, in writing, by the Engineer. Obtain written consent from the property owner. Milled material not being spread on the roadway side slopes requires a Solid Waste Disposal Permit from the DEC. Obtain a permit for disposal of milled material or dispose the material in a site previously approved.

Remove millings immediately following rumble strip installation. Maintain the removal operation within 50 feet of the milling machine. Dry power brooming and power brooming without direct immediate means of collection/pickup is not permitted.

During milling operations keep the travel lanes free of milling debris. Do not berm the millings at the shoulder edge, do not allow milling debris to impede roadway drainage or enter waterways. Use a sweeper, sweeper/vacuum, (Subsection 643-3.04 No. 6, Street Sweeping, and Power Brooming), continuously removing waste material, including dust from the operation. Keep millings damp to help control airborne dust. Millings shall not enter adjacent lanes open to traffic.

Remove the waste material from the roadway surface and any adjacent pathway beyond the shoulder. Shoulder millings may be placed off of the road or pathway beyond the shoulder on the side slopes, except in areas where guardrail is present. Uniformly spread shoulder millings on the roadway side slopes; alternatively, it may become property of the Contractor and disposed of off the project as indicated above.

Milled roadway segments shall be returned to debris-free state prior to re-opening for traffic.

406-4.01 METHOD OF MEASUREMENT. Section 109 and as follows:

Measure pay units by station, foot, or mile parallel to the centerline of the highway.

Station. A single lineal measurement for every measured station for each shoulder rumble strip and centerline rumble strip installed.

Linear Foot. A single lineal measurement for every measured foot of rumble strip installed.

Mile. A single lineal measurement for every measured mile for each shoulder rumble strip and centerline rumble strip installed.

Shoulder rumble strip measurement includes gaps (provided for bicycles or other as shown in the Plans) between groups of rumble strips.

406-5.01 BASIS OF PAYMENT. Section 109.

All work, including test strips and materials, is subsidiary to 406 Pay Items, except where specified as individual Pay Items.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
406.0001.____	Rumble Strips	LS
406.0002.____	Rumble Strips	STA
406.0003.____	Rumble Strips	LF
406.0008.____	Rumble Strips, Shoulders	Mile
406.0012.____	Rumble Strips, Centerline	Mile
406.2001.____	Sweeping and Disposal of Millings, Shoulders	LS
406.2002.____	Sweeping and Disposal of Millings, Centerline	LS

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DIVISION 500 — STRUCTURES

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Special Provision

Replace Section 507 with the following:

SECTION 507
BRIDGE BARRIERS AND RAILING

507-1.01 DESCRIPTION. Construct safety railing as shown on the Plans.

507-2.01 MATERIALS. Use materials that conform to the following:

Concrete	Section 501
Epoxy-Coated Reinforcing Bars	Subsection 709-2.01
Grout	Section 701
Cable	Use ¼ inch galvanized wire rope with a minimum breaking force of 7,000 pounds.

CONSTRUCTION REQUIREMENTS

507-3.01 CONSTRUCTION REQUIREMENTS.

1. General. Construct railing to the line and grade shown on the Plans. Set rail posts plumb. Place railing after all falsework is removed and the span is self-supporting.

3. Concrete. Construct concrete barriers to meet applicable requirements of Sections 501 and 503. Use Class A concrete with a specified compressive strength of 4000 psi. Apply a rubbed finish to exposed surfaces of concrete.

507-4.01 METHOD OF MEASUREMENT. Section 109.

507-5.01 BASIS OF PAYMENT. The contract price includes all rail elements, rail posts, brackets, spacers, fastenings and anchors required to construct and install the cable safety railing system.

Payment will be made under:

Pay Item No.	Pay Item	Pay Unit
507.0006.0000	Cable Safety Railing	Linear Foot

SSP18-010116

Special Provision

Replace Section 511 with the following:

SECTION 511
MECHANICALLY STABILIZED EARTH (MSE) WALL

511-1.01 DESCRIPTION. Furnish and install a mechanically stabilized earth wall system with precast concrete facing panels and metallic, strip or grid, soil reinforcement. Provide one system; multiple systems are not permitted.

511-1.02 SUBMITTAL. All manufacturers are required to submit documentation for the Engineer's review and approval.

Submit complete working drawings and calculations, in accordance with Subsection 105-1.02 and 511-2.01.4, sealed and signed by a Civil Engineer registered in the State of Alaska. Allow 21 days for review.

511-2.01 MATERIALS. Furnish materials in accordance with Subsection 105-1.03 and Section 106. Substitutions require the Engineer's written approval, before the working drawings are approved.

Meet the following:

Class A Concrete	Section 501
Precast Concrete Panels	Section 501
Reinforcing Steel	Section 503
Structural Steel	AASHTO M 270
Pipe and Perforated Pipe	Section 706
Geotextile for Drainage	Subsection 729-2.02
Geogrid	Subsection 729-2.05
Geocomposite Drainage System	As Specified
Porous Backfill Material	Subsection 703-2.10

1. Structure Backfill and Foundation Fill. Provide backfill materials used in the structure volume free from organic or otherwise deleterious materials (less than 1 percent as determined by ATM 203) and conform to the gradation requirements of Selected Material, Type A (Section 703-2.07) with a maximum size of 6-inches or less as determined by ATM 304. Do not exceed a plasticity Index (P.I.) of 6 as determined by ATM 204 and ATM 205. Provide material with a sodium sulfate soundness loss of less than 10 percent after four cycles, determined in accordance with AASHTO T 104 and free of shale or other particles of low durability.

   When using backfill material with 80 percent passing the 3/4-inch sieve, the minimum angle of internal friction, on the portion of the material finer than the No. 10 sieve, must be 34 degrees, as tested by AASHTO T 236.

   Electrochemical Requirements. Steel soil reinforcement, use backfill material meeting the following:

ELECTROCHEMICAL REQUIREMENTS

REQUIREMENTS	VALUE	TEST METHOD
Resistivity	1200 ohm inches min.	AASHTO T 288
pH	5 - 10	AASHTO T 289
Chlorides	50 ppm max.	AASHTO T 291
Sulfates	100 ppm max.	AASHTO T 290

   The state will perform corrosion tests. Notify the Engineer of the backfill source not less than 30 days before wall construction.

2. Wall Members. Provide facing consisting of precast concrete panels.

   Manufacture concrete panels with a minimum concrete compressive strength of 4,000 psi. Finish the exposed face with ordinary finish. Locate soil reinforcement connection hardware during concrete placement to avoid contact with the panel reinforcing steel.

   a. Concrete Face Panels. Fabricate panels conforming to Section 501, with the following exceptions and additions.

      (1) Forms. Do not strip the forms from the units until the concrete reaches a minimum compressive strength of 1000 psi.

      (2) Angle Points. Changes in the wall alignment shall be accomplished using prefabricated angled corner panels or special columns of the same texture and size as the flat panels, such that a continuous panel is traversing the angle point without a break in the normal horizontal and vertical joint pattern, unless directed otherwise by the Engineer. Bevel panels, or field outs that disrupt the normal joint pattern, and/or result in a single vertical line, are not permitted.

      (3) Marking. Clearly scribe the date of manufacture, the production lot number, and the piece mark, in the unexposed face of each panel.

      (4) Handling, Storage, and Shipping. Handle, store, and ship all panels in such a manner as to protect them from chipping, discoloration, cracks, and fractures. Support panels in storage on firm blocking to protect the panel connection devices, and the exposed exterior finish. Ship the units after reaching a minimum compressive strength of 3300 psi.

      (5) Tolerances. Manufacture all panels within the following tolerances.

         (a) Panel Dimensions. Position panel strap connection devices within 1-inch, all other dimensions within 3/16-inch.

         (b) Panel Squareness. Squareness as determined by the difference between the two diagonals, not to exceed 1/2-inch.

         (c) Panel Exposed Surface Finish. Surface defects on smooth formed surfaces measured on a length of 5-feet, not to exceed 1/8-inch. Surface defects on the textured-finished surfaces measured over a length of 5-feet, not to exceed 3/16-inch.

         (d) Panel Hidden Surface Finish. Provide a uniform surface finish free of open pockets of aggregate or surface distortions in excess of 1/4-inch.

      (6) Testing.

         (a) Compressive Strength. Production lots shall determine the acceptance of concrete panels with respect to compressive strength. A single compressive strength sample will represent a production lot of a group of panels. A production lot will consist of either ten panels or a single day's production, whichever is less.

            During the production of the concrete panels, the manufacturer will randomly sample the concrete in accordance with ATM 501. A single compressive strength sample, consisting of a minimum of four cylinders, will be randomly selected for every production lot.

            Perform compression tests on a standard 6-inch by 12-inch test specimen in accordance with ATM 506. Conduct compressive strength testing in accordance with ATM 214.

For every compressive strength sample, cure a minimum of two cylinders in accordance with ATM 506 and test at twenty-eight days. The average compressive strength, when tested in accordance with ATM 214, will provide a compressive strength test result that will determine the compressive strength of the production lot.

Compressive strength test result greater than or equal to 4000 psi will be accepted by the Engineer for the production lot. If the compressive test result is less than 4000 psi, then the acceptance of the production lot will be based on the following acceptance criteria.

Meet each of the requirements:

I. Ninety percent of the compressive strength test results for the overall production shall exceed 4060 psi.
II. The average of any six consecutive compressive test results shall exceed 4200 psi.
III. No individual compressive strength test result shall fall below 3600 psi.

(b) Air Content. Perform air content tests in accordance with ATM 505. Take air content samples at the beginning of each day's production and take compressive samples at the same time to insure compliance.

(c) Slump Test. Perform the slump test in accordance with ATM 503. Determine the slump at the beginning of each day's production and take the compressive samples at the same time.

(d) Rejection. Failure to meet any of the requirements (6)(a) thru (6)(c) will result in rejection of units. In addition, the Engineer will reject the panel(s) if any of the following conditions exist.

I. Faulty casting
II. Honeycombed or open texture concrete
III. Cracked, including hairline cracks, or severely chipped panels
IV. Unreasonable color variation on front face of panels

b. Joint Materials. Bearing pads, joint filler, and joint cover materials according to the MSE wall supplier's recommendations.

c. Concrete Leveling Pad. Class A concrete.

3. Soil Reinforcement. Carefully inspect reinforcing and attachment devices to ensure that devices are true to size and free from defects that may impair strength and durability. The metallic strip or grid shall meet the design requirements of AASHTO Standard Specifications for Highway Bridges, latest Edition, and the wall suppliers design recommendations.

Galvanize all steel soil reinforcement and any steel connection hardware to meet AASHTO M 111. Manufacture steel strip reinforcement by hot rolling to meet ASTM A572, Grade 450, or approved alternate.

4. Working Drawings. Prepare working drawings as noted in 105-1.02 and as noted here. Include:

a. Earthwork requirements including specifications for material and compaction of backfill.

b. Details of revisions or additions to drainage systems or other facilities required to accommodate the system.

c. Existing ground elevations verified by the Contractor for each location, involving construction wholly or partially in original ground, before preparing the final working drawings.

d. Complete design calculations substantiating that all proposed designs satisfy the design parameters in the Contract documents. Include all design assumptions. Demonstrate the internal and external stability of the wall system. Include, in the external stability analysis, sliding, eccentricity, bearing capacity, and global stability analysis for static and seismic conditions. Comply with the design parameters shown on the Plans, the Specifications and the latest AASHTO LRFD Bridge Design Specifications including interims.

(1) Use the minimum height and length for any system that will effectively retain the earth behind the structure for the loading conditions, contours, profile, slope lines, or other limiting parameters shown in the Plans or in the approved working drawings. The wall system dimensions may be slightly greater, not less, than shown on the Plans and approved working drawings.

Typically the Contractor should provide the following information: DOT to provide the following information places liability on the Owner.

(2) Include design soils information:

(a) Foundation soil unit density and angle of internal friction
(b) Retained soil unit density and soil angle of internal friction
(c) Reinforced soil unit density and angle of internal friction

e. Complete details of all elements required for the proper construction of the wall system, including complete material specifications.

Wall system work, requiring working drawings, is prohibited until the required working drawings are approved.

5. Acceptance of Material. Furnish the Engineer with a Certificate of Compliance certifying that all materials, excluding backfill, comply with the applicable contract specifications. Furnish the Engineer with a copy of all test results performed by the Contractor necessary to assure Contract compliance.

Acceptance will be based on the Certificate of Compliance, accompanying test reports, and visual inspection by the Engineer. The Engineer may require additional testing.

511-3.01 CONSTRUCTION REQUIREMENTS.

1. Excavation and Backfill. Excavate and backfill earth retaining systems to meet Section 205. Replace excavated material with structure backfill material meeting Section 205. Compact the material as specified under Subsection 203-3.04 and herein.

a. Foundation Preparation. Grade the foundation for the structure level for a width equal to or exceeding the length of reinforcement elements plus 1-foot or as shown in the Plans. Before wall construction, compact the foundation with two passes of a vibratory drum compactor, except where constructed on rock. Remove foundation soils found to be unsuitable and replace with backfill according to Section 205.

2. Drainage. Provide outlet works at sags in the profile and at the low ends of the gutter.

a. Weep Holes. Place a minimum of 2-cubic feet of porous backfill material encapsulated with geotextile at each weep hole. Cover joints between retaining wall panels, which function as weep holes, with geotextile. Dry and thoroughly clean the face panels that are to receive the geotextile.

b. Drainage Blankets. Construct drainage blankets consisting of porous backfill material encapsulated in geotextile, collector pipes, outlet pipes, and cleanout pipes. Construct and compact the subgrade to receive the geotextile so it is free of loose or extraneous material and sharp objects that may damage the geotextile. Stretch, align, and place the fabric in a wrinkle-free manner. Overlap adjacent borders of the fabric from 12-inches to 18-inches. Repair torn or punctured fabric by covering the damaged area with a piece of fabric large enough to cover the damaged area and meet the overlap requirement.

Place the porous backfill material in horizontal layers and thoroughly consolidate by the same methods specified for structure backfill. Prohibit ponding or jetting of porous backfill material or structure backfill material. Maintain a minimum of 6-inches of porous backfill material, structure backfill, or embankment material between the fabric and the equipment during spreading and compaction of the porous backfill material.

Place perforated collector pipe, when required, within the porous backfill material to the flow line elevations shown. Place outlet pipes at sags in the flow line and at the low end of the collector pipe. Construct rock slope protection, when required, at the end of outlet pipes, as shown on the Plans. Place cleanout pipes at the high ends of collector pipes.

c. Geocomposite Drainage Systems. Place and secure the geocomposite drainage material tightly against the excavated face, lagging or back of wall. Protect the drainage material against physical damage and grout leakage when concrete is to be placed against geocomposite drainage material.

3. Retaining Wall Construction. Construct mechanically stabilized earth walls consisting of a facing system (precast concrete panels) to which steel soil reinforcement is connected.

Provide a field representative from the proprietary wall system on-site and available during the erection of the wall.

Provide a cast-in-place concrete leveling pad, of the type shown in the Plans or approved working drawings, at each panel foundation level. Cure the concrete a minimum of 24 hours before placement of wall panels. Place panels and support to achieve the final position.

a. Installation Tolerances. Handle panels for erection as the MSE wall supplier recommends. Panels shall be placed in successive horizontal lifts in the sequence shown on the working drawings as backfill placement proceeds. As backfill material is placed behind the panels, maintain the panels in the final position by means the wall supplier recommends. Concrete panels vertical and horizontal alignment tolerances shall not exceed 3/4-inch when measured with a 10-foot straight edge. During construction, the maximum allowable offset in any panel joint shall be 3/4-inch. The overall vertical tolerance of the wall (top to bottom) shall not exceed 1/2-inch per 10-foot of wall height. The plumb and tolerances of each panel row at the face shall be checked before erection of the next panel row. Should panels be out of tolerance, remove the fill, and reset panels to proper tolerances. Make joint openings between panels uniform and no larger than 1 1/4-inch and no smaller than 1/2-inch.

Place reinforcement elements normal to the face of the wall, unless otherwise shown on the Plans. Before placement of the reinforcing elements, compact backfill according to Section 205 and below.

b. Backfill Placement. Place and compact backfill material following erection of each course of panels. Place backfill in such a manner as to avoid distortion, damage, or displacement of the wall materials. Backfill to an elevation approximately 1 1/4-inch above the facing connection level before placing the next level of soil reinforcement. Roughly level the backfill material before placing the soil reinforcement. Uniformly tension all soil reinforcement to remove any slack in the connection or material. Correct misalignment or distortion of the facing panels and soil reinforcement. Remove and replace wall materials that become damaged during backfill placement.

Compact backfill to 95-percent of the maximum density as determined by ATM 207, or ATM 212. Where spread footings support bridge or other structural loads, compact the top 5-feet below the bottom of the footing elevation to 98-percent as determined by ATM 207, or ATM 212. Do not exceed 8-inches maximum lift thickness after compaction. Decrease this lift thickness, if necessary to obtain the specified density. The Engineer will determine field density using ATM 213, and ATM 214.

Use a lightweight mechanical tamper, roller, or vibratory system with at least three passes to achieve compaction within 3-feet of the back face of the wall facing.

The Engineer will take a minimum of one density test at each level of soil reinforcement material.

Slope the last level of backfill away from the wall facing to permit rapid water runoff away from the wall face at the end of operations each day. Do not allow surface runoff from adjacent areas to enter the wall construction site.

Install joint filler, bearing pads, and joint-covering material concurrently with face panel placement. Furnish and install instrumentation for monitoring corrosion, where specified.

511-4.01 METHOD OF MEASUREMENT. Section 109, and the following:

Pay Item 511.0001.____ Mechanically Stabilized Earth Wall: by the square foot of wall face. The vertical height of each section is measured on the outer face from the top of the leveling pad, to top of wall prior to installation of coping. Measure tapered wall sections using the average height resulting from the height measured at each end of the tapered section.

Pay Item 511.0002.____ Wall Cap Coping: by the linear foot measured horizontally along the top of the wall.

511-5.01 BASIS OF PAYMENT. The contract price includes full compensation for the earth retaining structure including incidentals required to complete the work; including but not limited to: facing panels, soil reinforcement, MSE and random backfill soil, bar reinforcing steel, excavation, leveling pad, coping, and all parts of or appurtenances to the earth reinforcement system, complete-in-place.

The field representative, replacing damaged face panels and other corrective work are subsidiary.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
511.0001.____	Mechanically Stabilized Earth Wall	SF
511.0002.____	Wall Cap Coping	LF

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DIVISION 600 — MISCELLANEOUS CONSTRUCTION

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SECTION 602
STRUCTURAL PLATE PIPE

Special Provisions

602-1.01 DESCRIPTION. Add the following: Furnish and install buried structures for wildlife crossings. Provide design calculations and load ratings with an independent design check. This work shall include the design, furnish, and installation of footings for Wildlife Crossing 1.

This work shall be completed in conjunction with Section 690 Waterway Restoration.

Add the following Subsection:

602-1.02 DEFINITIONS.

Designer of Record (DOR). A civil engineer registered as a Professional Engineer in the State of Alaska and in responsible charge of the work described. The DOR must have adequate and relevant prior structural design and inspection experience.

Independent Engineer (IE). Engineer in responsible charge of the independent design check. The engineer responsible for the check must have adequate and relevant prior structural design experience. IE will prepare a separate (independent) set of engineering computations verifying the adequacy of the design, details, and load ratings.

Independent Design Check (IDC). An independent check of the design, drawings, and load rating calculations including but not limited to: design, location and dimensions of the foundation, structural members, connections, erection plans and temporary bracing (when required), safety barrier, and independent calculations of design loads, member stresses, material properties, hydraulic capacity and scour protection. IDC will assure the structural adequacy of the design and details, and verify compliance with contract provisions, appropriate sections of the AASHTO *LRFD Bridge Design Specifications*, and the AASHTO *Manual for Bridge Evaluation*.

CFHWY00693

Replace Subsection 602-2.01 with the following:

602-2.01 MATERIALS. Use materials that conform to the following:

Bedding and Backfill	Subsection 204-2.01
Structural Concrete	Section 501
Reinforcing Steel	Section 503
Flexible Watertight Gaskets	Subsection 705-2.05
Corrugated Steel Pipe, Pipe Arches, and Underdrains	Subsection 707-2.01
Corrugated Aluminum Alloy Culvert Pipe and Underdrains	Subsection 707-2.03
Structural Plate Culverts	Subsection 707-2.04

CR602.1-010120 / CFHWY00693

Add the following:

Pea Gravel	Subsection 703-2.17

Plate thickness and corrugations shall be determined by the manufacturer in accordance with design requirements of this Section.

CFHWY00693

Replace Subsection 602-3.01 with the following:

602-3.01 CONSTRUCTION REQUIREMENTS. Lay field-assembled plate pipes in conformance to the lines and grades approved by the Engineer. Excavation, grading, shaping, and backfill must conform to Subsection 204-3.01.

Repair damage to the zinc coating according to AASHTO M 36.

Comply with the manufacturer's recommendations and instructions. Provide the Engineer with a copy of the documentation.

CR602.1-010120 / CFHWY00693

Add the following:

Contractor shall place pea gravel under haunches of pipe where adequate compaction cannot be obtained by standard compaction devices (e.g., rollers, skid plates, jumping jacks, etc.). Shape pipe bedding and pea gravel prior to installation of pipe.

For the Wildlife Crossing #2, place Selected Material, Type C in constructed pipe as shown in the Plans. Grade surface to match existing ground surface outside of pipe.

For the Wildlife Crossings #2, thrust beams shall be constructed if required by the manufacturer of the horizontal ellipse structures. Design of the thrust beams, if required, shall be in accordance with design requirements of this Section. Shape monitoring during installation and backfill of the horizontal ellipses shall be required if recommended by the manufacturer. A representative from the horizontal ellipse culvert's manufacturer is required to be on site during structure assembly, installation and backfill.

Construct 3-foot high cable safety rail at top of and 1.5 feet behind headwalls and wingwalls for Wildlife Crossings and MSE Retaining walls as shown in the Plans.

The headwalls and wingwalls shall be constructed by an approved mechanically stabilized earth method in accordance with Section 511. The wingwalls shall be sloped to match approximate slope of embankment in accordance with elevations provided in the Plans. Headwalls and wingwalls must be capable of supporting the adjacent HL-93 live loading and the soil bearing pressures of the fill used in the roadway construction.

CFHWY00693

Add the following Subsection 602-3.02 Joining Pipe:

602-3.02 JOINING PIPE. Joints shall provide circumferential and longitudinal strength to preserve the pipe alignment, prevent separation of pipe sections, and provide a watertight joint between new sections of pipe and joints between new and existing sections of pipe of similar and dissimilar materials. Include a continuous gasket (seal) in all joints. Construct the watertight joint capable of passing a laboratory hydrostatic pressure and vacuum test of at least 4 psi for 10 minutes.

CR602.1-010120 / CFHWY00693

Add the following subsection 602-3.03:

602-3.03 DESIGN REQUIREMENTS AND SUBMITTALS. Retain the services of a DOR to prepare working drawings and complete calculations. Submit the working drawings and calculations, sealed and signed by a Civil Engineer registered in the State of Alaska, in accordance with Subsection 105-1.02 and this Section.

1. Design buried structures according to the following documents:
   a. *DOT&PF Standard Specifications for Highway Construction* for recommended construction methods, material properties, and sampling and testing.
   b. *AASHTO LRFD Bridge Design Specifications* as modified by this Section.
   c. *DOT&PF Preconstruction Manual.*

2. Design buried structures to conform to the following requirements:
   a. To support 100% of HL-93 live loads or the Contractor's maximum construction load, whichever is greater, without overstress.
   b. Include the capacities and demands of load-supporting members in the design calculations.
   c. Provide the buried structure dimensions indicated on the plans.
   d. Provide the minimum vertical clearance shown on the plans.
   e. To support loads from utilities identified in the Contract.

3. Provide working drawings for buried structures that include:
   a. All dimensions controlling the design and erection.
   b. All design loads and material properties. Indicate governing live load on working drawings.
   c. The soil bearing values.
   d. The openings required on the plans, including horizontal and vertical clearances, and the location of guardrail or barrier.

4. Provide load ratings of the buried structures according to the most recent version of the AASHTO *Manual for Bridge Evaluation* (MBE*),* including interim revisions. Load rate steel and concrete structures using the Load Factor Rating (LFR) and Load and Resistance Factor Rating (LRFR) methods. **LFR load rating prepared in accordance with National Corrugated Steel Pipe Association (NCSPA) Design Data Sheet No. 19 is an acceptable alternative to LFR load rating according to the AASHTO MBE.**

   Include values for moment, shear and, where applicable, axial stresses. Specify live load type, placement for maximum stress, distribution, and impact.

   Include the following cases for LFR load ratings:
   a. Design inventory with multiple lanes and impact included
   b. Design operating with multiple lanes and impact not included
   c. Operating with one lane centered on the bridge and impact not included.

   Include the following cases for LRFR load ratings:

   a. Design inventory with multiple lanes and impact included
   b. Design operating with multiple lanes and impact included
   c. Operating with one lane centered on the bridge and impact not included.

602-5.01 BASIS OF PAYMENT. Add the following:

Payment for working drawings, design, and load ratings is subsidiary to Section 602 pay items.

All material and labor required to construct and install footings for Wildlife Crossing #1 shall be subsidiary to Section 602 pay items.

Selected Material, Type A and C, D-1 base course, cable safety rail, mechanically stabilized earth headwalls and wingwalls, riprap, and separation geotextile fabric are paid for under Sections 203, 301, 507, 511, 611, and 630, accordingly.

Pea gravel is subsidiary to Section 602 pay items.

Thrust beams, if required, are subsidiary to Section 602 pay items.

Shape monitoring, if required, and providing an onsite manufacturer representative is subsidiary to Section 602 pay items.

Temporary hot mix asphalt at pavement breaks is subsidiary to Section 602 pay items.

Removal of pavement, culvert baffles, headwalls, temporary water diversion, dewatering and rewatering, are subsidiary to 602 Pay Items.

Traffic control paid under Section 643 and Erosion, sediment, and pollution control paid under Section 641.

Add the following pay items:

Pay Item No.	Pay Item	Pay Unit
602.0002.____	Structural Plate Pipe, 22'-0" Span, 10'-0" Rise	Linear Foot
602.0002.____	Structural Plate Pipe-Arch, 20'-7" Span, 13'-2" Rise	Linear Foot

CFHWY00693

Special Provision

Replace Section 603 with the following:

SECTION 603
CULVERTS AND STORM DRAINS

603-1.01 DESCRIPTION. Construct or reconstruct culvert and storm drain pipe. Install culvert marker posts, and strap plastic culvert ends.

603-1.02 REFERENCES.

ASTM D3953 Standard Specification for Strapping, Flat Steel and Seals
ASTM D4675 Standard Guide for Selection and Use of Flat Strapping Materials

603-2.01 MATERIALS. Use materials that conform to the following:

Bedding and Backfill	Subsection 204-2.01
Joint Mortar	Subsection 705-2.04
Flexible Watertight Gaskets	Subsection 705-2.05
Non-reinforced Concrete Pipe	Subsection 706-2.01
Reinforced Concrete Pipe	Subsection 706-2.02
Corrugated High Density Polyethylene (HDPE) Pipe	Subsection 706-2.07
Corrugated Steel Pipe and Pipe Arches	Subsection 707-2.01
Corrugated Aluminum Pipe	Subsection 707-2.03
Galvanize	Subsection 716-2.07
Culvert Marker Posts (Flexible Delineator Posts)	Subsection 730-2.05

Item 603.0017.____, Pipe, listed in the bid schedule, furnish either Corrugated Steel Pipe (CSP), Corrugated Aluminum Pipe, Reinforced Concrete Pipe, or Corrugated Dual Wall HDPE (plastic) Pipe. Select pipe for each installation that meets or exceeds the requirements shown on the Plans for height of cover.

For steel and plastic pipe, match the end section material to the pipe material.

Separate dissimilar materials with an electrical insulating material. The insulating material must be at least 1/16 inch thick and approved by the Engineer.

Culvert marker post is 6-foot tall by 2.5 inches wide with reinforcing ribs, capable of a 9-inch minimum bending radius, and blue with no marking.

Culvert marker Strap and Seals according to ASTM D3953. .625 inch x .02 inch, dry Type 1 regular-duty (magnetic, ferritic), galvanized Finish B (hot-dipped Grade 2 moderate coating, .18 oz./ft^2 surface or .0002 inch thick minimum. Push type seals, Style III (overlap), regular duty, galvanized Finish B (hot-dipped coating) by 1.75-inch minimum length and matched to strapping width.

CONSTRUCTION REQUIREMENTS

603-3.01. GENERAL. Excavate, bed, and backfill according to the requirements of Subsections 204-2.01 and 204-3.01, and the Plans.

603-3.02. LAYING PIPE. Begin the pipe laying at the downstream end of the pipe. Keep the lower segment of the pipe in contact with the bedding throughout its full length. Place bell or groove ends of rigid pipe and outside circumferential laps of flexible pipe facing upstream.

Lay paved or partially lined pipe so that the longitudinal centerline of the paved segment coincides with the flow line. Install elliptical conduit and circular conduit reinforced with other than a full circular cage or cages so the orientation of a vertical plane through the longitudinal axis of the conduit does not vary more than 5 degrees from the design orientation.

Repair damaged metallic coating on metal pipe according to AASHTO M36.

603-3.03 JOINING PIPE. Joints shall provide circumferential and longitudinal strength to preserve the pipe alignment, prevent separation of pipe sections, and provide a watertight joint between new sections of pipe and joints between new and existing sections of pipe of similar and dissimilar materials. Include a continuous gasket (seal) in all joints. Construct the watertight joint capable of passing a laboratory hydrostatic pressure and vacuum test of at least 4 psi for 10 minutes.

1. Rigid Pipe. Use either bell and spigot or tongue and groove joints. Join pipe sections with the ends fully entered and the inner surfaces reasonably flush and even.

   Use one or more of the following joint materials, or any other if approved:

   a. Portland cement mortar

   b. Portland cement grout

   c. Rubber gaskets

   d. Coupling bands

   e. Preformed plastic sealing compound

   Make mortar joints using an excess of mortar to form a bead around the outside of the pipe.

   For grouted joints, use molds or runners to retain the poured grout. Install rubber ring gaskets to form a flexible, watertight seal.

   When using portland cement mixtures, protect the completed joints against rapid drying using suitable covering material.

2. Metal Pipe. Join the metal pipe firmly using connecting bands conforming to ASTM B745 (Corrugated Aluminum Pipe) and ASTM A760 (Corrugated Steel Pipe) and as noted herein. Use bands that are no more than two nominal sheet thicknesses lighter than the pipe jointed, and in no case more than 0.052 inches lighter. Include a gasket each side of the gap.

   a. Primary Band. Furnish and install corrugated bands so that the band corrugations match and conform to the corrugations of the pipe. Conform to the following guidelines:

      (1) The gap between the pipes joined is in the center of the band and is no wider than one corrugation width.

      (2) Band for 12-inch through 30-inch diameter pipe are at least 12 inches wide.

      (3) Bands for pipe with diameters greater than 30 inches are at least 22 inches wide.

   b. Secondary Band. Use this band only where it is not physically possible to use primary bands, such as on field-cut pipe ends, joining new pipe to existing pipe, etc. Furnish and install deformed metal sheet bands (dimple bands) so that the projections match and are the same depth as the pipe corrugations. Form these projections in circumferential rows with one projection for each corrugation of the helical pipe.

      Conform to the following guidelines:

      (1) The gap between the pipes joined is in the center of the band and is no wider than 2 inches.

      (2) Bands for 12-inch diameter pipe are at least 12 inches wide and have one circumferential row of projections for each pipe end joined.

      (3) Bands for pipe with diameters greater than 12 inches are at least 24 inches wide and have two circumferential rows of projections for each pipe end joined.

3. Plastic Pipe. Use push-on or mechanical joints. Ensure that the plastic pipe couplings' corrugation matches the pipe corrugation and that their width is not less than one-half the nominal pipe diameter.

Furnish all bolted connections on coupling bands with cut washers placed between the nut and the angle bracket or use nuts with integral washers.

Take up any pipe that is out of alignment, unduly settled, or damaged and re-lay or replace it.

603-3.04 CULVERT MARKER.

a. Marker Post. Install a culvert marker on the approach side of storm drain outfalls 30 inches and smaller, field inlets not in paved parking lots, all end sections to cross culverts, or as directed. Drive to maintain forty-two inches of post above the ground after driving, and

b. Marker Strap. In addition to marker posts, install marker strap around the plastic pipe ends.

   Position the strap in the valley of the first annular ring from the top end of the culvert. From the vertical centerline of the culvert, at the top, overlap the strap and extend the ends to approximately 30 degrees each side of the centerline. Place the strap loosely without twists in the valley, without compressing the pipe, and tight enough to keep the strap from moving out of the valley without deforming the pipe or pipe corrugation. Seal the strap at three locations, one at each of the ends, and one at the top of the culvert. Extend the strap ends beyond the end seals approximately 1/2-inch. Double crimp the seal, two pairs of crimps minimum each seal.

   Repair the strap galvanizing where abraded and at cut ends according to ASTM A780. Prepare the surface with power tools per SSPC-SP11, hand tools per SSPC-SP2, and as required by the paint manufacturer. Apply paint, Type – paint containing zinc dust, to the prepared surfaces and allow enough time for curing as required by the manufacturer's printed instructions.

603-4.01 METHOD OF MEASUREMENT. Section 109, and as follows:

1. Culvert Pipe. The length of pipe, measured in place, along the invert.

2. Pipes for Storm Drains. The length of pipe, measured in place, along the invert, from center to center of structures. The length through the inlets, catch basins, and manholes is included in the measured length.

603-5.01 BASIS OF PAYMENT. Branch connections and elbows are subsidiary to the pipe unless included as a separate Pay Item.

Coupling bands, seals (gaskets), and other items necessary for the proper joining of the sections are subsidiary.

Culvert markers are subsidiary to the pipe.

Excavation, bedding, and backfill paid under Section 204.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
603.0001.____	CSP ___ Inch	LF
603.0002.____	___ Inch CSP Arch	LF
603.0003.____	End Section for CSP ___ Inch	Each
603.0004.____	End Section for ___ Inch CSP Arch	Each
603.0009.____	Corrugated Aluminum Pipe ___ Inch	LF
603.0010.____	___ Inch Corrugated Aluminum Pipe Arch	LF
603.0011.____	End Section for Corrugated Aluminum Pipe ___ Inch	Each
603.0012.____	End Section for ___ Inch Corrugated Aluminum Pipe Arch	Each
603.0013.____	Reinforced Concrete Pipe, ___ Inch, Class ___	LF
603.0014.____	Reinforced Concrete End Section, ___ Inch	Each
603.0015.____	Elbow, (Type & Size)	Each
603.0016.____	Branch Connection (Type & Size)	Each
603.0017.____	Pipe ___ Inch	LF
603.0019.____	___ Inch Pipe Arch	LF
603.0020.____	End Section for Pipe ___ Inch	LF
603.2032.____	Corrugated HDPE Pipe ___	Linear Foot
603.2033.____	End Section for Corrugated HDPE Pipe ___	Each

CR603-010120

Temporary Waterway Diversion and Dewater Work Areas-Draft. This provision is available as an individual provision in the AllProvisions folder for addition to Section 205, 602, 603 and other sections as applicable to a specific project. Includes notes for use.

205-CR205.1-060117CrkDiversionDewaterWithNotes

CULVERT AND STORM DRAINS

Pipe Material and Use:

Discuss the culvert and storm drain design, including the culvert material and the need for thaw pipes and wires (Section 616), with the CR Hydrologist and the Maintenance and Operations Department no later than the PIH design phase.

1. Use HDPE material for culverts and storm drains (706-2.07), except as noted in 2, 3, and 4 below.
2. Use galvanized steel culvert material (10 gage or lower):
   a. Culverts larger than the maximum size available for HDPE. HDPE is available up to 60 inches. (The cover requirement in D-04.21 Sheet 3 presently does not go beyond 48 inches.)
   b. Locations where the cover and/or live load is too high for HDPE. (D-04.21 sheets do not include the latest HS loading.)
   c. Culverts exposed to the combination of fresh water and floating ice.
   d. Culverts that must meet fish passage criteria.
3. Use aluminum culvert material when in salt water with floating ice. Use a gage two below that permitted by D-04.21 Sheet 1.
4. Project specific conditions may require thick walled HDPE. Evaluate conditions such as high abrasion, low pH, or high dead and or lived load on a cases-by-case basis. The minimum thickness required related to the standard dimension ratio (SDR – pipe diameter to wall thickness) of 32.5, included in 706-2.07.

Vertical and Horizontal Separation between Storm Drain Facilities and Water Lines

An Alaska Department of Environmental Conservation (ADEC) waiver may be required depending on the proximity of an Alaska Department of Transportation (ADOT) storm drain to a water line. This is a concern, primarily, in the Municipality of Anchorage (MOA) and the Matanuska Borough. If you believe a waiver may be required, provide DEC with plans and specifications for review. Under most project conditions, a DEC waiver will not be required.

Special Provisions

Replace Section 606 with the following:

SECTION 606
GUARDRAIL

606-1.01 DESCRIPTION. Construct new guardrail, terminal sections, transition rail, and permanent crash cushions.

The permanent crash cushion, hereafter referred to as, "crash cushion," includes the complete assembly (crash cushion, foundation, backstop or transition) represented in the FHWA eligibility letter(s).

Remove and reconstruct or remove and dispose of existing guardrail, terminal sections, transition rail, and crash cushions.

CR606-020119R

CR606.13. All projects with highway safety appurtenances. Essential replacement parts as part of the contract. FHWA memo "Eligibility of

Furnish and store new highway safety appurtenance essential replacement parts (replacement parts) listed in Table 606-1. Repair damage, from highway crashes, with the replacement parts.

CR606.13-050119R

606-1.02 SUBMITTALS.

1. Submit the following at the preconstruction conference and receive approval before installation.

    a. Permanent Crash Cushions.

        (1) FHWA Eligibility Letter(s). Eligibility letters demonstrating each crash cushion assembly is MASH 2016 compliant with the AASHTO 2016 Manual for Assessing Safety Hardware (MASH-16) Test Level 3. Demonstrate the eligibility letter shielding widths cover the hazard widths and travel directions shown in the plans.

        (2) AASHTO Listing Category. AASHTO listing or documented updates for the crash cushion classification as listed in the 2011 AASHTO Roadside Design Guide, Section 8.4.

        (3) Manufacturers' Shop Drawings, Assembly, and Installation Instructions. Submit shop drawings and detailed assembly and installation instructions for the crash cushion as included in the FHWA Eligibility Letters.

        (4) Manufacturer Certification Letter. Certify the crash cushion(s) meet the requirements of the FHWA eligibility letter(s), are suited to the Contract requirements including the environmental conditions at the installation site.

        (5) Manufacturers' Installer Certification Letter. Certify the installation contractor is familiar with and trained to install the crash cushion.

        (6) Manufacturers' Installation Checklist. Submit a crash cushion installation checklist.

    b. Parallel Terminals.

        Manufacturer Installation Checklist. Submit an Assembly Installation Checklist.

2. Submit the following after installation.

   a. Permanent Crash Cushions.

      (1) Manufacturer Certification Letter. Certify the installed crash cushion(s) meet the requirements of the FHWA eligibility letters. Submit the certification letters(s) signed and dated no more than 14 days after installation.

      (2) Manufacturers' Installation Checklist. Submit the completed installation checklist signed by the Installer and Manufacturer no more than 14 days after installation. Complete the checklist after each assembly.

   b. Parallel Terminals.

      Manufacturer Installation Checklist. Submit the completed installation checklist signed by the Installer and Manufacturer no more than 14 days after installation. Complete the checklist after each assembly.

606-2.01 MATERIALS. Use materials that conform to the following:

Concrete, Class B	Section 550
Flexible Delineator Posts	Subsection 730-2.05
Guardrail Connection Plate	Section 722
Guardrail Hardware	Subsection 710-2.07
Guardrail Posts and Blockouts	Subsection 710-2.06
High Strength Bolts	Section 722
Metal Beam Rail	Subsection 710-2.04
Terminals	Subsection 710-2.11
Terminal Markers	Subsection 730-2.05
Wire Cable	Subsection 709-2.02

Guardrail Reflector Assembly Brackets, Side-Mounted. Aluminum alloy.

Retroreflective Sheeting.

1. Post-Mounted Flexible Delineators and Guardrail Reflectors. ASTM D4956 Type IX or XI.

2. Terminal Markers. ASTM D4956 Type VIII, IX or XI.

Permanent Crash Cushion Assembly.

Crash cushions include the complete assembly as included in the Eligibility Letter, the crash cushion, the foundation, and rigid backup anchorage, or transition connection. Install an added Terminal Marker or other flexible delineator to the front of the crash cushions as recommended by the Manufacturer.

Design the crash cushion for the installation location environment. Snow combined with frequent freeze-thaw cycles creates significant ice buildup that may impair the performance of the crash cushion. Design to mitigate the effects from snow and ice. Crash cushions using supports that interlock and travel within fixed tracks at or below the first six inches from ground level, and crash cushions not designed to mitigate snow and Ice buildup are not acceptable for permanent use. Crash cushion covers, when available from the manufacturer, are required as part of the crash cushion installation.

Crash Cushion Classifications. 2011 AASHTO Roadside Design Guide, 4th Edition. The Engineer will determine the final classification of each materials submittal. Provide redirective and non-gating crash cushions of the type specified in the plans and matching the description noted below.

1. Sacrificial: Demonstrated designed for a single impact.

2. Reusable Crash Cushion. Demonstrated to have major components survive most impacts intact and salvageable. Some components require replacement after a crash.

3. Low-maintenance and Self-restoring Crash Cushion. Demonstrated to suffer very little, if any damage, upon impact and easily pulled back into their full operating condition. They may partially rebound after an impact and may only need an inspection to ensure that no parts have been damaged or misaligned.

CR606-020119R

CONSTRUCTION REQUIREMENTS

606-3.01 GENERAL. Install guardrail and terminals at the locations shown on the Plans. Conform to the Alaska Standard Plans and these Specifications.

At locations where public traffic is adjacent to guardrail work, have all materials on site, including crashworthy terminals, that are required to completely install a segment of guardrail before beginning work on that segment.

Start guardrail installation at the "upstream" end (the end adjacent traffic encounters first) by either installing a crashworthy terminal, connecting to an existing barrier or shielding the end with a crash cushion or truck mounted attenuator (TMA) meeting NCHRP 350, Test Level 3. Continue installation in the direction of traffic. Exception: if the guardrail run connects to existing barrier, buried in the backslope terminal, existing or new bridge railing, or other existing structure at the "downstream" end, guardrail installation may start at the point of connection.

Do not leave posts installed for guardrail within the clear zone for more than 48 hours before installing the rail. At the end of each work shift, install drums or Type II barricades with flashing warning lights to delineate incomplete sections of guardrail and terminal sections.

If guardrail runs are not completed within 10 calendar days after beginning installation, install temporary crash cushions meeting NCHRP 350 or MASH test level 3 at all non-crashworthy guardrail ends within the construction clear zone. Apply Traffic Price Adjustment if the Contractor does not comply with the crash cushion requirement.

When possible, proceed with construction of guardrails with the direction of traffic.

Where necessary, adjust the height of existing guardrail to provide a smooth transition to new guardrail. Use 25 linear feet of guardrail or two 12' 6" pieces of guardrail to transition to match the existing or new guardrail elements and/or end treatments.

After shaping the slopes and staking proposed guardrail terminal section locations, request the Engineer to field verify their locations. Receive approval of the staked locations before installing terminal sections.

Treat field cuts to timber posts and blockouts according to AWPA standard M 4.

Install blockouts according to manufacturer's recommendations and as shown on the plans.

Install side-mounted guardrail reflectors and post-mounted flexible delineators as follows:

1. at intervals noted on the plans or Alaska Standard Plans, starting with the first guardrail post beyond terminal sections
2. with the retroreflective sheeting facing approaching traffic
3. with retroreflective sheeting on both sides, on two-way roadways
4. not on the terminal sections, except as shown on the plans
5. at or below 500 feet in elevation, except as noted otherwise in the Plans.

Attach terminal markers, in a vertical position, to the P.T. post of Short Radius Guardrail sections and to the post where the flare begins for parallel guardrail terminals. Coordinate terminal marker locations with the Engineer.

At the end of each work shift, install drums or Type II barricades with flashing warning lights to delineate incomplete sections of guardrail and terminal sections.

CR606-020119R

CR606.13. All projects with highway safety appurtenances. Essential replacement parts as part of the contract. FHWA memo "Eligibility of

Do not remove existing highway safety appurtenances, guardrail and similar, before mobilization of the replacement parts to the project storage location.

CR606.13-050119R

606-3.02 POSTS. Set posts to accommodate the line, grade, and curvature shown on the Plans.
Use either wood or steel posts when allowed by the type of guardrail specified, subject to the following:

1. Exclusive of end treatments, use one type of post in each run of guardrail.

Set posts as follows:

1. Set posts plumb, in the location and to the depth shown on the Plans or Alaska Standard Plans.

2. Choose an installation method that does not damage the post, adjacent pavement, structures, utility conduits, and final slopes. Repair all damage to the satisfaction of the Engineer, or replace the damaged item, as per subsection 105-1.11.

3. Set wood or steel posts in dug, drilled, or pre-punched holes. Steel posts may also be set by ramming or driving if:

    a. The underlying material is no larger than six inch; and

    b. The posts are not damaged during installation.

4. Backfill and compact around posts with material as specified in the typical section to firmly support the post laterally and vertically. Compact under and around posts to the Engineer's satisfaction.

5. For placement in solid rock or broken rock embankment greater than six inch, set wood or steel posts in pre-dug, pre-drilled, or pre-punched holes.

6. In new roads, install posts before final shoulder or median compaction, surfacing, and paving.

606-3.03 BEAM RAIL. Fabricate metal work in the fabricator's shop. Bend curved guardrail elements with radii less than or equal to 100 feet in the fabricator's shop or with an approved bending apparatus.

Receive approval before field punching, cutting, or welding. Repair damaged spelter coat areas on galvanized rail elements according to AASHTO M 36 (ASTM A760).

Lap rail elements so that the exposed ends face away from approaching traffic in the adjacent lane.

Use bolts long enough to extend at least 1/4 inch beyond the nuts. Except where required for adjustments, do not extend bolts more than 1 inch beyond the nuts.

Locate bolts at expansion joints at the center of the slotted holes.

Tighten bolts at expansion joints to snug-tight. Make all other bolts fully-tight.

606-3.04 CABLE RAIL. Install cable guardrail according to the Plans and Specifications. Install at the locations shown on the Plans.

606-3.05 TERMINAL SECTIONS.

Parallel Terminals.

Install terminal sections according to the manufacturer's recommendations for the entire length of the terminal then, if required, transition rail height over 25' to match guardrail height and splice location.

Install ASTM D4956 Type III, IV, or V retroreflective sheeting on the end section of parallel terminals consisting of yellow and black bars sloping 45 degrees downward toward the traffic side of the terminal according to guidance for Object Markers for Obstructions Adjacent to the Roadway in Chapter 2C of the ATM.

Submit the manufacturers' complete Assembly Installation Checklist signed and dated after completing installation to support acceptance for each installation, see Subsection 606-1.02 for further information.

606-3.06 REMOVAL AND RECONSTRUCTION OF GUARDRAIL. Remove and reconstruct guardrail as specified. Replace lost or damaged materials without extra compensation.

When replacing existing guardrail complete the replacement run installed within 14 calendar days after removal.

For guardrail located within 50 feet of bridge ends, remove and replace the existing guardrail in the same work shift.

606-3.07 REMOVAL AND DISPOSAL OF EXISTING GUARDRAIL. Remove the existing guardrail, including the rail, cable elements, terminal sections, hardware, posts, concrete bases, and steel tubes. Backfill resulting holes with material in 6-inch layers that is similar to the existing embankment and compact to the same approximate density.
Guardrail.
When salvaging guardrail insert the appropriate M & O station specific to the project in place of NA
Notify the Engineer a minimum of 5 days before removing guardrail. The Engineer will notify the ADOT & PF, M & O, and have an M & O representative designate portions of guardrail for salvage. Deliver salvaged guardrail and associated hardware to the M & O station located at _____.
Remaining items removed become the Contractor's property.

Permanent Crash Cushion.

When salvaging crash cushions insert the appropriate M & O station specific to the project in place of NA

Notify the Engineer a minimum of 5 days before removing permanent crash cushions. The Engineer will notify the ADOT & PF, M & O, and have an M & O representative designate portions of the crash cushion for salvage. Deliver salvaged crash cushion and associated hardware to the M & O station located at ___ NA . Remaining items removed become the Contractor's property.

606-3.08 ADJUST EXISTING GUARDRAIL. When called for on the Plans, reset existing guardrail to the height shown on the applicable Alaska Standard Plan, measured from the top of the rail to the finished shoulder surface below the rail. Raise and lower the posts several times to prevent settlement and then re-drive them to the height shown on the Plans. Use other methods if approved.

606-3.09 INSTALL NEW GUARDRAIL. Install guardrail as shown on the applicable Alaska Standard Plan, measured from the top of the rail to the finished shoulder surface below the rail.

Install MASH-16 Test Level 3-compliant W31 guardrail as shown on the plans. Install new guardrail in conformance with tolerances shown on the plans.

606-3.10 TERMINAL MARKERS. For each parallel rail terminal, attach a terminal marker to the extreme piece of rail.

Attach flexible markers, in a vertical position, to the terminal end directly to the backside of the rail face, the face away from the traveled way, or the first post of each parallel guardrail terminal. Provide an additional marker where the flare begins for guardrail terminal widening. Provide two markers at the end of each run of guardrail; coordinate the locations with the Engineer.

Attach the flexible markers using hardware and attachment methods recommended by the manufacturer. The connection shall not negatively influence the performance of the guardrail as noted in 606-2.01.

606-3.11 LENGTH OF NEED VERIFICATION. After shaping the slopes and staking the proposed guardrail locations, notify the Engineer to field verify the beginning and ends. The Engineer will approve the staked location of the guardrail before installation. When the Engineer determines additional guardrail is required, complete the installation immediately.

606-3.12 PERMANENT CRASH CUSHION. Install crash cushions according to the manufacturer's instructions.

Construct crash cushions to shield the hazard width and travel direction shown in the plans.

Manufacturer's Crash Cushion Installation Certification. Submit the Manufacturer's Crash Cushion Installation Certification letter signed and dated after completing installation, see Subsection 606-1.02 for further information.

Manufacturer Certified Installers. Install crash cushions using installers certified by the crash cushion manufacturer. Install Crash cushions as follows:

1. Parallel to the approach traveled way or as shown on the plans.

2. Follow Section 203 for the excavation and embankment requirements of the concrete base component of the crash cushion.

3. Follow Section 501 for a concrete pad, sized according to the manufacturer's recommendations, constructed on a minimum of 12 inches of Selected Material, Type B.

4. Cut or fill to the top of the concrete pad with Selected Material, Type B at 12:1 or shallower on installations in grass median.

5. Install top elevation of concrete pad flush to pavement edge when adjacent to or within asphalt pavement.

6. Bolt crash cushion to median barrier with manufacturer approved barrier to crash cushion connector when attached to median barrier.

7. Install a terminal marker or other flexible delineator on the nose of each crash cushion as recommended by the manufacturer. The terminal marker is in addition to, not a substitute for, the retroreflective delineation installed on the crash cushion nose.

8. Manufacturers' Crash Cushion Installation Checklist. Submit the installation checklist signed and dated after completing installation, see Subsection 606-1.02 for further information.

The crash cushion installation is not complete until the Crash Cushion Manufacturers' Installation Checklist and Installation Certification letter are submitted and the Engineer accepts the installation.
Excess excavated material is the property of the Contractor.

606-3.14 HIGHWAY SAFETY APPURTENANCE – ESSENTIAL REPLACEMENT PARTS. Install replacement parts as directed.

CR606.13. All projects with highway safety appurtenances. Essential replacement parts as part of the contract. FHWA memo "Eligibility of

Deliver the remaining new replacement parts, at time of substantial completion, to the State Maintenance and Operations Station, located at: _____.

Replacement Parts for Safety-related Hardware" June 10, 2008.

Notify the Engineer no less than 7 days before delivery.

CR606.13. Fill in the maintenance and operations station specific to the project.

CR606.13-050119R

606-4.01 METHOD OF MEASUREMENT. Section 109 and as follows:

1. Guardrail. Measured along the face of the rail or cable, from the center of the end posts.

   Short Radius Guardrail. Per each, installed in place.

   When the guardrail is connected to a terminal section, the pay limit for the rail ends where the specified terminal section begins.

2. Terminals. (Bridge Rail Thrie Beam Transition or Bridge Rail W-Beam Transition). Per each, installed in place.

3. Transition Rail. Per each accepted connection.

4. Permanent Crash Cushion. Each installed and accepted.

606-5.01 BASIS OF PAYMENT.

Payment for temporary crash cushions or TMA installed to protect motorists when guardrail installations are not completed within 10 calendar days of beginning installation is subsidiary to other items.

1. Guardrail. Side-mounted guardrail reflectors, post-mounted flexible delineators, terminal markers, guardrail beam, posts, blockouts, and associated hardware are subsidiary. Installation of downstream anchors, transitions for rail height and splice locations, long span guardrail sections, and guardrail stiffening sections are subsidiary to guardrail installation.

2. Short Radius Guardrail Sections. The contract price includes all materials from the terminal anchor to and including the first wood or steel post of standard guardrail or guardrail end terminal, and including the terminal anchor assembly, in-line anchor, terminal posts, short radius guardrail posts, rail elements, terminal markers, and associated hardware required for a complete installation.

3. Terminal Sections.

   a. Parallel Guardrail Terminal. The contract price includes rail elements, posts, blockouts, pipe sleeves, cable assemblies, guardrail extruders, terminal markers, and all associated hardware required for a complete installation.

4. Transition Rail. The contract price includes all brackets, beam sections, transition pieces, and all posts and associated hardware required for a complete connection of the guardrail section to a bridge rail or barrier.

5. Permanent Crash Cushion. The contract price includes all work and materials required to install each permanent crash cushion, foundations, and connections along with the manufacturer's field support, recommendations, and shop drawings. Removal and salvage of existing crash cushions is subsidiary to Pay Item 606.2007.____ Pay Item(s).

All material required for embankment widening for guardrail and terminal sections is paid for under the appropriate pay items shown in the bid schedule.

Guardrail salvage is subsidiary to Pay Item 606.0006.____ Removing and Disposing of Guardrail.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
606.0001.____	W-Beam Guardrail	LF
606.0002.____	Thrie Beam Guardrail	LF
606.2003.____	Box Beam Guardrail	LF
606.0004.____	Cable Guardrail	LF
606.0005.____	Removing and Reconstructing Guardrail	LF
606.0006.____	Removing and Disposing of Guardrail	LF
606.0007.____	Double-faced, W-Beam Guardrail	LF
606.0009.____	Short Radius Guardrail	Each
606.0013.____	Parallel Guardrail Terminal	Each
606.0015.____	Adjust Existing Guardrail	LF
606.0016.____	Transition Rail	Each
606.2007.____	Crash Cushion, Permanent _____	Each

CR606-020119R

TABLE 606-1
HIGHWAY SAFETY APPURTENANCES – ESSENTIAL REPLACEMENT PARTS

Contact Burrell Nickeson for table items and quantities; Burrell.nickeson@alaska.gov, (907)-269-0757

Essential Replacement Parts	Material Specification	Unit	Quantity
W-Beam Guardrail	Subsection 710-2.04	LF	
Thrie Beam Guardrail	Subsection 710-2.04	LF	
Cable Guardrail	Subsection 709-2.02	LF	
Box Beam Guardrail	Subsection 710-2.04	LF	
Wood Guardrail Post and Blockout	Subsection 710-2.06	Each	
Steel Guardrail Post and Blockout	Subsection 710-2.06	Each	
Short Radius Guardrail	Alaska Standard Plan G-26.00	Each	
Parallel Guardrail Terminal	Subsection 710-2.11	Each	
Transition Rail	Subsection 710-2.04	Each	
Crash Cushion, Permanent _____	Subsection 606-2.01	Each	
Precast Concrete Barrier	Subsection 501-3.01 & 709-2.01	LF	
Rigid Delineator	Subsection 730-2.05	Each	
Flexible Delineator	Subsection 730-2.05	Each	

Replace damaged replacement parts at no additional cost to the Department.

6. 606.2006.____ Essential Replacement Parts – Installation. Installation of the replacement parts according to the directive authorizing the work.

PAY ITEM

Item Number	Item Description	Unit
606.2005.____	Essential Replacement Parts	LS
606.2006.____	Essential Replacement Parts – Installation	CS

Make 606.2006.____ estimated amount equal to 100% of 606.2005.____.

CR606.13-050119R

SECTION 611
RIPRAP

Special Provision

611-2.01 MATERIALS. Replace the first paragraph with the following:

Evenly graded stones that are hard, angular, and have no more than 50 percent wear at 500 revolutions as determined by AASHTO T 96. Apparent specific gravity will be determined by ATM 308. Use stones with breadth and thickness at least 1/3 of its length. Do not use round boulders or cobbles on slopes steeper than 3:1.

CR611.1-020119

Replace section 615 with the following:

SECTION 615
STANDARD SIGNS

615-1.01 DESCRIPTION. Furnish and install standard signs and delineators. Remove and relocate or remove and dispose of existing signs and markers, as specified.

615-2.01 MATERIALS. Use materials that conform to the following Subsections:

Sheet Aluminum	730-2.01
High Density Overlaid Plywood	730-2.02
Retroreflective Sheeting, ASTM D4956	730-2.03
Sign Posts	730-2.04
Delineator Posts	730-2.05
Acrylic Prismatic Reflectors	730-2.06
Sign Support Fasteners	730-2.07

1. Shop Drawings. Submit shop drawings, for all signs that must meet the ASDS letter width and spacing charts, for approval before fabrication. Submit 4 sets of collated shop drawings prepared according to Subsection 105-1.02. Show the following on each sign drawing:

    a. Dimensions of all horizontal and vertical characters and spaces
    b. Overall dimensions
    c. Sign material and sheeting material type
    d. Panel thickness
    e. Legend and letter series
    f. Whether the sign will be framed

2. Sign Fabrication. Use ASTM D4956 Type IV retroreflective sheeting (for lettering, symbols, borders, and background) on sheet aluminum panels for all signs except the following:

    a. Orange Background Signs. Use Type IX or XI fluorescent orange reflective sheeting placed on sheet aluminum panels, except:

        (1) For temporary installations, the reflective sheeting place on aluminum, plastic, or plywood sheet panels.
        (2) For flexible signs, (Roll-Up Signs) use fluorescent reflective sheeting Type VI or better (based on durability and reflectivity, as determined by the Engineer). Roll-Up Sign – 3M Series RS 24, Reflexite Marathon Orange, or approved equal.

    b. Railroad Crossbucks and Vertical Crossbuck Supports: Use white ASTM D4956 Type VIII or Type IX or XI retroreflective sheeting for background of sign and all strips.

    c. Non-Illuminated Overhead Signs with White Legends on Green Backgrounds: Use ASTM D4956 Type IX or XI retroreflective sheeting for legends and background. Create the legend in one of the following ways:

        (1) Cut border and legend from white ASTM D4956 Type IX or XI retroreflective sheeting and adhere them to a green ASTM D4956 Type IX background, or
        (2) Cut stencil of border and legend out of green transparent acrylic film and use transparent adhesive to overlay the film on a white ASTM D4956 Type IX or XI retroreflective background.

d. Fluorescent Yellow-Green School Area Signs: Use ASTM D4956 Type VIII, Type IX or XI retroreflective sheeting for background.

Use a manufacturer-recommended clear coat on all screened signs.

Use sign layouts (including characters, symbols, corner radii, and borders) that conform to the ASDS.

3. Sign Posts and Bases. Use sign posts and bases of the types specified. The structural aspects of design and materials for sign supports must comply with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals. Do not splice sign posts.

   Use Class A concrete meeting the requirements of Section 501 for overhead Sign support foundations.

   Use Class B concrete for steel-reinforced roadside sign foundations meeting the requirements of Section 550. Concrete for other sign foundations may be Class W.

4. Delineators. Use delineator assemblies that conform to the requirements shown on the Plans. Fabricate flexible delineators using ASTM 4956 Type III, IV, V, IX or XI retroreflective sheeting.

5. Reflective Sheeting Warranty. Supply manufacturer's warranty for reflective sheeting, including retention of fluorescent yellow-green (measured in accordance with ASTM E2301) for ten years according to the following criteria:

   a. Minimum Fluorescent Luminance Factor Y_F: 20%
   b. Minimum Total Luminance Factor Y_T: 35%

   The warranty shall stipulate that: If the sheeting fails to meet the minimum fluorescence values within the first 7 years from the date of fabrication of the sign, the manufacturer shall, at the manufacturer's expense, restore the sign surface to its original effectiveness. If the reflective sheeting fails to meet the minimum fluorescence values within the 8th through 10th year from the date of fabrication, the manufacturer shall, at the manufacturer's expense, provide enough new replacement sign sheeting to the Department to restore the sign surface to its original effectiveness.

CONSTRUCTION REQUIREMENTS.

615-3.01 GENERAL.

1. Place posts in excavated holes to the depth shown on the Alaska Standard Plans.

2. Backfill the space around the posts and foundations placed in holes to finish ground with selected earth or sand, free of rocks or deleterious material. Place backfill in layers approximately 6 to 12 inches thick and thoroughly compact it.

3. Dispose of surplus excavated material neatly along the adjacent roadway as directed.4. Install flexible delineator posts according to the manufacturer's recommendations.

5. Attach sign panels to posts, electroliers, traffic signal standards, bridge rails, piers, and abutments using the types and sizes of fastening hardware shown on the Plans.

6. If using existing signs and mileposts that are removed and relocated, ensure they conform to the details shown on the Plans or as directed.

7. Verify the local Maintenance and Operations Station want salvaged signs from the project. Anchorage Station may not want the signs.

7. Sign Salvage:

   Notify the Engineer 5 working days prior to beginning sign salvage activities. The Engineer will physically identify those signs to salvage.

   a. Property of the State. When 615-3.01 7a identifies a maintenance station to receive sign salvage, the signs (sign panels, posts, and hardware) are the property of the State.

Protect all items from damage during salvaging and delivery. For each sign so designated, disconnect sign post from panel and group the panels together. Group posts together with their hardware. Deliver sign panels, posts, and hardware to the State Maintenance Station noted in these Special Provisions. Do not deliver salvaged materials until inspected and approved by the Engineer. Replace any items damaged by you at no additional cost to the Department.

Deliver salvaged sign panels, posts, and hardware to the State Maintenance and Operations Station, located at:

7. Place the Maintenance and Operations Station below, replacing "NA," when the station wants the salvaged signs,

_____.

b. Property of the Contractor. When 615-3.01 7a does not identify a State Maintenance and Operations Station; the signs salvaged (sign panels, posts, and hardware) are the property of the Contractor.

Remove project signs and/or parts designated for salvage, off the project site.

Dispose of foundations from salvaged existing signs in a manner approved of by the Engineer (remove and dispose, abandoned in place, or otherwise). If abandoned in place, remove the tops of the foundations, reinforcing steel, anchor bolts, and conduits to a depth of not less than 12 inches below roadway subgrade or unimproved ground, whichever applies. All signs and posts at a single installation considered as one unit.

Dispose of sign salvage not wanted by the Contractor, not used in the project, and not accepted by the Local Maintenance and Operations Station as required by Federal, State, and Municipal environmental regulations.

8. All materials and finished signs are subject to inspection and acceptance in place.

   a. Surfaces exposed to weathering must be free of defects in the coating that impair serviceability or detract from general appearance or color match.

   b. Finished signs must be clean and have no chatter marks, burrs, sharp edges, loose rivets, delaminated reflective sheeting, or aluminum marks. Do not make repairs to the face sheet.

9. Install the various breakaway assemblies according to the manufacturer's written instructions. Meet MASH crashworthiness requirement for breakaway hardware, unless approved otherwise by the Engineer.

10. Secure the anchors in templates and install them according to the manufacturer's written instructions.

11. Finish the foundation according to these tolerances:

    a. Do not use more than two shims per coupling.

    b. Do not use more than three shims to plumb each post.

    Remove and replace all foundations requiring more than three shims to plumb a post without extra compensation.

12. Construct the top of any foundation located on a slope so that the finished slope passes through the top center of the foundation. Grade the area 24 inches up and down slope of the foundation edge so that no portion of the foundation projects above the surrounding slope and water will drain away from the foundation.

13. Attach a label to the back of all standard signs in the lower right corner. Make the label at least 15 square inches and show the year the sign was purchased from the manufacturer. Show the last two digits of the year in clear and bold numbers. Make the label from ASTM D4956 Type I or brighter retroreflective sheeting. Use background and legend colors meeting Table 615-1.

TABLE 615-1

DECAL COLORS

YEAR	BACKGROUND COLOR	LEGEND COLOR
XXX1	Yellow	Black
XXX2	Red	White
XXX3	Blue	White
XXX4	Green	White
XXX5	Brown	White
XXX6	Orange	Black
XXX7	Black	White
XXX8	White	Black
XXX9	Purple	White
XXX0	Strong Yellow-Green	Black

Central values and tolerance limits for each color, as referenced in the MUTCD, are available from the Federal Highway Administration, (HHS-30), 400 7th St. SW, Washington, D.C. 20590

615-3.02 SIGN PLACEMENT AND INSTALLATION. The location and type of installation will be as shown on the Plans. Sign locations are approximate and subject to field adjustment by the Engineer.

Do not allow the top of the embedded steel tube to extend more than 2 inches above the surrounding ground and concrete foundation.

On all signs, install 2-inch diameter wind washers, colored to match the sign face, between the fastener head and the sign. Use rust-resistant washers fabricated from a material equal in strength to the sign blank.

Mount signs on mast arms level.

Bring existing signs that are to remain, into conformance with Standard Drawing S-05. Keep existing signs in service until they are no longer needed.

615-4.01 METHOD OF MEASUREMENT.

Standard Signs and Object Markers. By the total area of legend-bearing sign panel erected in place. No deductions in quantity for corner rounding will be made. Nominal dimensions for sign sizes indicated on the Plans will be used to calculate sign pay quantities. Octagons and round signs will be measured as rectangles. Only one side of each double-faced sign will be measured for payment.

Removal and Relocation. By each, complete in place.

Delineators. By each, complete in place. A single delineator consists of one post equipped with three reflectors.

Salvage Sign. By each complete sign delivered in acceptable condition.

615-5.01 BASIS OF PAYMENT. Sign posts, bases, and mounting hardware are subsidiary.

When Items 615.0002.____, 615.0003.____, or 615.0006.____ do not appear on the bid schedule, this work is subsidiary.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
615.0001.____	Standard Sign	SF
615.0002.____	Remove and Relocate Existing Sign	Each
615.0003.____	Remove and Relocate Milepost	Each
615.0004.____	Delineator, Rigid	Each
615.0005.____	Delineator, Flexible	Each
615.0006.____	Salvage Sign	Each
615.0007.____	Salvage and Dispose Sign	Each

CR615-010120

Replace Section 618 with the following:

SECTION 618
SEEDING

618-1.01 DESCRIPTION. Establish a healthy living perennial stand of grass or other vegetative living groundcover by seeding. Maintain the living cover for the term of the Contract.

618-2.01 MATERIALS. Use materials that conform to the following:

Water	Subsection 712-2.01
Seed	Section 724 (Grass Seed)
Fertilizer	Section 725
Topsoil	Section 726
Soil Stabilization	Section 619
Soil Stabilization Material	Section 727

CR618-050118R/CFHWY00693

Replace the Ingredients and Application Rates with the following:

The seed mix for Sterling MP 45-60, Sunrise to Skilak Lake Rd. shall consist of 50 percent, by weight, of Nortan Tufted Hairgrass, 25 percent, by weight, of Arctred Red Fescue, 15 percent, by weight, of Boreal Red Fescue, and 10 percent, by weight, of Annual Rye Grass as shown in Table 618-1.

Fertilize at 400lbs per acre using 10-10-8S as shown in Table 618-1. If 10-10-8S is not available 20-20-10 may be substituted.

TABLE 618-1
GRASS SEED MIX, SOIL STABILIZER, AND FERTILIZER APPLICATION RATES

Materials	Ingredients	Application Rate (per MSF[c])
Grass Seed Mix [a, b]	Nortan – Tufted Hairgrass Arctred – Red Fescue Boreal – Red Fescue Annual Ryegrass	0.75 lbs. 0.37 lbs. 0.23 lbs. 0.15 lbs. Total = 1.50 lbs.
Soil Stabilizer		
Slope ≤ 3:1	Mulch	46 lbs.
Slope >3:1	Mulch with tackifier	45-58 lbs.
Fertilizer	10-10-8S	10 lbs.

a. Do not remove the tags from seed bags.
b. Submit an alternate seed mix when the specified seed is not commercially available. Provide a letter confirming the specified seed is not available. Include an agronomist certified seed mix design, including application rate, suited to the project site.
c. MSF = 1000 ft^2.

CFHWY00693

CONSTRUCTION REQUIREMENTS

618-3.01 SURFACE PREPARATION. Remove ruts, holes, humps and other irregularities from the surface. Clear stones four inches in diameter and larger, weeds, plant growth, sticks, stumps, and other debris that will interfere with the application of stabilization material, topsoil, the seeding operation, growth of vegetative groundcover, and subsequent maintenance of the cover.

Smooth the slopes for a uniform appearance and round the top and bottom of the slopes to facilitate tracking or raking. Do not disrupt drainage flow lines.

Evenly place stabilization material and or topsoil when specified.

Prepare the surface material by grooving the material in a uniform pattern that is perpendicular to the fall of the slope. Use one or more of the following grooving methods with associated equipment before the application of seed:

1. Manual raking with landscaping rake;

2. Mechanical track walking with track equipment; or

3. Mechanical raking with a scarifying slope board. Form one-inch wide grooves spaced no more than six inches apart.

618-3.02 SEEDING SEASON. Seed disturbed areas after permanent cessation of ground disturbing activities in that area, within the period specified in the Alaska Department of Environmental Conservation (ADEC) Alaska Pollutant Discharge Elimination System (APDES) Construction General Permit (CGP) for Alaska, Section 4.5 Soil Stabilization, and Section 641 Erosion, Sediment, and Pollution Control.

Do not seed during windy conditions, when climatic conditions or ground conditions would hinder placement or proper growth.

Seed between May 15 and August 15.

618-3.03 APPLICATION. Seed, seeding, reseeding includes the application of seed, fertilizer, and stabilization material.

If the seed mix, fertilizer and stabilization material are not included in the Plans or Specifications, including their application rates, use the recommendations of the ADNR and the Revegetation Manual for Alaska.

Do not seed areas of bedrock and plant beds.

CR618-050118R/CFHWY00693

Add the Following:

Fertilizer shall not be used within 50 feet of anadromous water bodies.

CFHWY00693

Use any of the following methods:

1. Hydraulic Method

   Apply seed and stabilization material in one application when using the hydraulic method. Apply fertilizer with the hydraulic method. Include the fertilizer with the seed and stabilization material or apply separately.

   a. Furnish and place a slurry made of seed, fertilizer, water, and other materials.

b. Use hydraulic seeding equipment that will maintain a continuous agitation and apply a homogeneous mixture through a spray nozzle. The pump must produce enough pressure to maintain a continuous, nonfluctuating spray that will reach the extremities of the seeding area with the pump unit located on the roadbed. Provide enough hose to reach areas not practical to seed from the nozzle unit situated on the roadbed.

c. If mulch material is required, it may be added to the water slurry in the hydraulic seeder after adding the proportionate amounts of seed and fertilizer. Add seed to the slurry mixture no more than 30 minutes before application.

d. Mix the slurry and apply it evenly.

2. Dry Methods

a. Use mechanical spreaders, seed drills, landscape seeders, aircraft, cultipacker seeders, fertilizer spreaders, or other approved mechanical spreading equipment.

b. Spread fertilizer separately at the specified rate.

618-3.04 MAINTENANCE. Maintenance includes but is not limited to the following:

1. Protecting seeded areas against traffic by approved warning signs or barricades and against erosion.

2. Repairing surfaces gullied or otherwise damaged following seeding. Fill erosion gullies 4 inches deep and greater filling the gully to surrounding grade including the portions less than 4 inches deep. Apply and prepare the stabilization material and or topsoil for seeding. Seed repaired area. Refer to Subsections 618-3.01 & 3.03.

3. Reseeding areas not showing evidence of satisfactory growth within 3 weeks of seeding and after repairs are complete. Reseed bare patches of soil more than 10 square feet in area. Contact ADNR for advice or corrective measures, when seeded areas are not showing evidence of satisfactory growth.

4. Watering seeded areas for healthy growth of vegetative cover. Adjust the amount of water when directed.

618-3.05 ACCEPTANCE. The vegetative groundcover will be inspected considering each station and each side of the road a separate area. Acceptance of the cover requires a minimum of 70% cover density in the inspection area, gullies repaired and reseeded, and no bare patches of soil more than 10 square feet in area.

Repair/reseed areas that are not accepted.

618-3.06 PERIOD OF ESTABLISHMENT. For each area accepted, the establishment period extends one complete growing season following the date of Project Completion, Subsection 105-1.15. Employ all possible means to preserve/maintain the new vegetative groundcover in a healthy and vigorous condition to ensure successful establishment. Maintain the vegetative cover, according to Subsection 618-3.04, to not less than the requirements for acceptance, Subsection 618-3.05.

618-4.01 METHOD OF MEASUREMENT. Section 109 and as follows:

Seeding by the Acre. By the area of ground surface acceptably seeded and maintained.

Seeding by the Pound. By the weight of dry seed acceptably seeded and maintained.

Water for Seeding. If weighed, a conversion factor of 8.34 pounds per gallon will be used to convert weights to gallons.

MGAL equals 1000 gallons.

618-5.01 BASIS OF PAYMENT.

1. Pay Items 618.0001.____ and .0002.____ Seeding. Payment is for healthy established vegetative groundcover through the establishment period.

   a. The initial surface preparation, seed, fertilizer, mulch when applied hydraulically, their application, and the water for hydraulic application are subsidiary.

   b. Maintenance fill, stabilization material, topsoil, surface preparation, seed, fertilizer, mulch when applied hydraulically, and the water required for hydraulic application are subsidiary.

2. Pay Item 618.0003.____ Water for Seeding. Payment is for water applied for growth of vegetative groundcover through the establishment period. Water for hydraulic application of materials is subsidiary to Pay Items 618.0001.____ and .0002.____.

Except for maintenance, stabilization material is paid under Section 619 and topsoil under Section 620.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
618.0001.____	Seeding	Acre
618.0002.____	Seeding	LB
618.0003.____	Water for Seeding	MGAL

CR618-050118R

Special Provision

Replace Section 619 with the following:

SECTION 619
SOIL STABILIZATION

619-1.01 DESCRIPTION. Furnish, install, and maintain materials to stabilize the soil. Control erosion, sediment, and pollution.

619-1.02 RELATED SECTIONS, REFERENCE ORGANIZATIONS, AND STANDARD DOCUMENTS.

1. Alaska Department of Transportation and Public Facilities (ADOT&PF):

   Standard Specifications for Highway Construction, 2017 Edition.
   - Seeding ..... Section 618
   - Topsoil ..... Section 620
   - Planting Trees and Shrubs ..... Section 621
   - Silt Fence ..... Section 633
   - Erosion, Sediment, and Pollution Control ..... Section 641
   - Soil Stabilization Material ..... Section 727

2. American Association of State Highway and Transportation Officials (AASHTO):

   Standard Practice for:
   - Compost for Erosion/Sediment Control (Filter Berms and Filter Socks) ..... R 51
   - Compost for Erosion/Sediment Control (Compost Blankets) ..... R 52

3. United States Composting Council (USCC):
   - Testing Methods for the Examination of Compost and Composting (TMECC)
   - Seal of Testing Assurance Program (STA) documents

4. Erosion Control Technology Council (ECTC)
   - Hydraulic Erosion Control Products (HECPs) Specification Chart
     Table 1, Performance Chart for Standard HECPs
   - Rolled Erosion Control Products (RECPs) Specification Chart
     Table 1, Rolled Erosion Control - Temporary
     Table 2, Rolled Erosion Control - Permanent

5. National Transportation Product Evaluation Program (NTPEP)
   - Testing and Evaluation of Products Materials and/or Devices

6. Texas DOT/Texas Transportation Institute (TTI) Hydraulics and Erosion Control Laboratory

619-1.03 SUBMITTALS. Submit stabilization and erosion, sediment and pollution control performance testing results with certifications for each material, Section 619-2.01 Materials. Submit a sample of each material to the Engineer 7 days before the scheduled installation.

1) Test compost, all applications, no more than 90 days before installation.
2) At a minimum, certificate will include the name of the manufacturer, product name, style number or similar, chemical composition of the material, the fibers, netting, yarn and similar and the weed free status of the material.
3) Organic materials shall be accompanied with all applicable health certificates and permits.
4) Furnish a Material Safety Data Sheet (MSDS) that demonstrates the product is not harmful to plants, animals, and aquatic life.

619-2.01 MATERIALS. Select stabilization materials, individually or a combination of, matched to the project applications/conditions (sheet flow, concentrated flow, slope, length of slope, access, etc.) providing performance and functional longevity meeting the most restrictive requirements of the Construction General Permit (CGP), the approved Storm Water Pollution Prevention Plan (SWPPP) and Section 641 Erosion, Sediment and Pollution Control.

1) Mulch ..... Subsection 727-2.01
   - Dry Erosion Control, Stabilization Products
   - Hydraulic Erosion Control Products (HECPs)
2) Matting ..... Subsection 727-2.02
   - Rolled Erosion Control Products (RECPs)
3) Sediment Retention Fiber Rolls (SRFRs) ..... Subsection 727-2.03
   - Filter Socks
   - Compost Socks
   - Coir Logs
4) Compost ..... Subsection 727-2.04
5) Tackifier ..... Subsection 727-2.05
6) Soil Binders (Polyacrylamide (PAM)) ..... Subsection 727-2.06
7) Geotextile-Encased Check Dams and Sediment Barriers ..... Subsection 727-2.07
8) Sandbag ..... Subsection 727-2.08
9) Manufactured Inlet Protection System ..... Subsection 727-2.09
10) Clear Plastic Covering ..... Subsection 727-2.10
11) Staples ..... Subsection 727-2.11
12) Other stabilization materials submitted to and approved by the Engineer.

Include on the packaging the manufacturer's name, the content, the air dry-weight and the guaranteed chemical analysis of the contents. Ship and deliver to the site in the original, unopened containers.

CONSTRUCTION REQUIREMENTS

619-3.01 GENERAL. Stabilization may include individual or a combination of materials, including but not limited to temporary seeding, mulch, tackifier, staples, matting, stabilizing emulsions, soil binders, dustless sweeping, dust palliatives, and others.

1. Material Storage and Protection. Store materials elevated off the ground and covered protecting them from construction and or damage from the environment including but not limited to:
   - Precipitation
   - Extended ultraviolet radiant including sunlight
   - Chemicals that are strong acids or other
   - Flames and welding sparks
   - Excess temperatures
   - Other environmental conditions that may damage the materials

2. Fabrication.
   a. Sandbags. Sand bags shall measure 15 inches by 30 inches. Place approximately 1.0 cubic foot of select Material, Type B, in each sandbag sack. Close the open end of the sandbag as recommended by the fabric manufacturer.

619-3.02 SURFACE PREPARATION. Clear all areas to be stabilized of stones 4 inches in diameter and larger and of weeds, plant growth, sticks, stumps, and other debris or irregularities that might interfere with the stabilization operation, growth of cover (where vegetative cover is part of the stabilization operation) or subsequent maintenance of the vegetative-covered area(s).

Smooth the surface of the area(s) to be stabilized; make the areas reasonably free of ruts, holes, and humps; trackwalk if required by the manufacturer; apply the stabilization material to each area.

If specified, apply topsoil to the area to be stabilized before application of the stabilizing material. Section 618 and 620.

619-3.03 APPLICATION. Apply stabilization material, including rate of application, according to the specifications. If not specified, apply according to the manufacturer's requirements. Where manufacturer requirements conflict with the specification, except where the Engineer directs otherwise, apply the material according to the requirements of the manufacturer.

If seeding is specified, except where seed is included in the stabilization material, complete the application of stabilization materials within 24 hours after seed is placed.

Do not use vehicles or equipment which cause rutting or displacement of the subgrade or topsoil.

1. Temporary Seeding. Annual Ryegrass per Subsection 724-2.02, Table 724-1. Apply at a rate of 1/2 lb/1000 sq. ft., minimum, on level ground to a maximum of 1 1/2 lb/1000 sq. ft., maximum, on sloping ground and highly erodible soils. Prepare surface and place seed as noted under Subsection 619-3.02 Surface Preparation and Section 618 Seeding. Confirm application of temporary seeding with the Engineer.

2. Tacking Agents - Tackifiers. Apply tacking agents according to the manufacturer's installation instructions matched to the application providing functional longevity, erosion control effectiveness, and vegetative establishment.

3. Soil Binders. Apply soil binders according to the manufacturer's installation instructions.

    a. Using Polyacrylamide (PAM) and PAM with Short-Term Mulch:
    Apply PAM on bare soils.

    Apply PAM and PAM with short-term mulch only where sediment control is in place and complete.

    Do not apply PAM and PAM with short-term mulch on saturated ground during rainfall.

    b. Using Moderate-Term Mulch:
    Apply moderate-term mulch according to manufacturer's installation instructions. If the curing period to achieve maximum performance is greater than the time period before precipitation is predicted, or the soil is saturated, do not apply the moderate-term mulch except as approved by the Engineer.

    c. Using Long-Term Mulch:
    Apply long-term mulch according to the manufactures installation instructions.

4. Erosion Control Blankets (ECBs). Select blankets, as specified by the manufacturer, to match the slope; and installed according to the manufacturer's instructions rolled out on well prepared soils to assure intimate contact and anchored with staples, stakes and or anchor trenches. Temporary erosion control blankets with 60 percent or greater open area may be installed prior to seeding. Place blankets with less than 60 percent open area immediately after the seeding operation.

    Staple matting/ECBs as recommended by the manufacturer for the application.

5. Compost Blankets. Construct compost blankets according to latest AASHTO R 52 and as specified. Use coarse compost and place over bare soil a blanket of 2 inch minimum thickness, except as otherwise specified. Apply material either by hand spreading and or pneumatically. Compost will have no free water visible or produce dust when handled. Place compost before seeding or mix seed with compost.

6. Check Dams. Place check dams as soon as possible and practicable or when and where if directed by the Engineer. Place the check dams perpendicular to channels and construct of a height sufficient to maximize detention while keeping the water in the channel. Place and install check dams according to the Plans and anchor to maintain in effective position.

    a. Sandbag. Place the initial row in tight contact with the ditchline for the length of the dam. Place each following row centered across the joint between the bags of the lift/row below.

7. Stabilized Construction Entrance.
   Temporary stabilized construction entrance shall be constructed according to the Plans, prior to beginning any clearing, grubbing, earthwork, or excavation.

   When the stabilized entrance no longer prevents track out of sediment or debris, the Contractor shall either rehabilitate the existing entrance to original condition, or construct a new entrance.

   When the Plans require a tire wash in conjunction with the stabilized entrance, the Contractor shall include details for the tire wash and the method for containing and treating the sediment-laden runoff as part of the SWPPP. All vehicles leaving the site shall stop and wash sediment from their tires.

8. Sediment Control Barriers. Sediment control barriers shall be installed according to the Plans or manufacturer's recommendations in the areas of clearing, grubbing, earthwork, or drainage prior to starting those activities.

   a. Sandbag. Place the initial row in tight contact with the surface perpendicular to the slope. Place each following row centered across the joint between the bags of the lift/row below.

   b. Sediment Retention Fiber Rolls.

   c. Silt Fence.

   d. Compost Berm. Construct compost berms according to latest AASHTO R 51. Use coarse compost.

9. Turf Reinforcement Mats. According to manufacturer's installation instructions.

619-3.04 MAINTENANCE. Maintain stabilized areas in a satisfactory condition for the term of the Contract. Inspect as required by the CGP, approved SWPPP, and Section 641 Erosion, Sediment and Pollution Control and correct any deficiencies immediately. Remove and dispose of temporary measures, including trapped sediment and contaminants, off project at approved locations. Materials manufactured as degradable may be left in place when approved by the Engineer.

Maintenance includes but is not limited to:

   a. Protecting stabilized areas against traffic by approved warning signs or barricades.

   b. Repairing surfaces gullied or otherwise damaged following application of stabilization material(s).

   Where seeding is included as a part of the soil stabilization:

   c. Reseeding, as required by Section 618 Seeding. Reapply the stabilization materials correcting the problems of the initial application.

   d. Watering, where vegetative growth is part of the soil stabilization, according to Section 618 Seeding.

The Engineer will perform inspection of the stabilization as required in the CGP, Section 641, and the SWPPP. Make repairs as required by same and as directed.

619-4.01 METHOD OF MEASUREMENT. Section 109, measured on the slope of the ground surface.

619-5.01 BASIS OF PAYMENT. Water, maintenance, repair, removal, and disposal of temporary stabilization materials are subsidiary.

Seeding is paid under Section 618 Pay Items, topsoil under Section 620 Pay Items, silt fence under Section 633 Pay Items and temporary erosion, sediment, and pollution control under 641 Pay Items.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
619.0001.____	Mulching	SY
619.0002.____	Matting	SY
619.2001.____	Compost	SY
619.2002.____	Turf Reinforcement Mat	SY
619.2003.____	Sediment Retention Fiber Rolls	LF
619.2004.____	Check Dam and Sediment Barrier (-Geotextile)	LF
619.2005.____	Check Dam	LF
619.2006.____	Sediment Barrier	LF
619.2007.____	Compost Berm	LF
619.2008.____	Sandbags	Each
619.2009.____	Manufactured Inlet Protection System	Each
619.2010.____	Sandbag Inlet Protection System	Each
619.2016.____	Mulch	SY

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Above are included the primary Pay Items for this Section. Supplement the primary Pay Items with the Pay Items listed here when more specific Pay Items are needed. Last four digits are included here as included in AWP.

619.2003.000A	Fiber Rolls - SRFR Filter Sock	LF
619.2003.000B	Fiber Rolls - SRFR Compost Sock	LF
619.2003.000C	Fiber Rolls - SRFR Coir Log	LF
619.2016.0000	Mulch - HECP BFM	SY
619.2016.000A	Mulch - HECP SMM	SY
619.2016.000B	Mulch - HECP MBFM	SY
619.2016.000C	Mulch - HECP PSFM	SY
619.2016.000D	Mulch - HECP FRM-FGM	SY
619.2016.000E	Mulch - HECP FRM-ET-FGM	SY
619.2016.000F	Mulch - HECP Dried Peat Moss	SY
619.2016.000G	Mulch - HECP Wood Strand, Fiber	SY
619.2016.000H	Mulch - Shredded Bark Mulch	SY
619.2016.000I	Mulch - Straw	SY
619.2018.000A	Matting - RECP Control Nets	SY
619.2018.000B	Matting - RECP Netless Rolled ECB	SY
619.2018.000C	Matting - RECP Single-Net ECB	SY
619.2018.000D	Matting - RECP Single-Net OWT	SY
619.2018.000E	Matting - RECP Double-Net ECB	SY

SECTION 630
GEOTEXTILE FOR EMBANKMENT AND ROADWAY SEPARATION, STABILIZATION AND REINFORCEMENT

Special Provision

630-3.01 CONSTRUCTION. Replace Table 630-1 Geotextile Placement on Curves with the following:

TABLE 630-1
GEOTEXTILE PLACEMENT ON CURVES

Degree of Curve	Maximum Segment Length (ft.)
1	125
2	90
3	75
4	65
5	55
6	50

CR630.1-010120

Replace Section 634 with the following:

SECTION 634
GEOGRID SOIL REINFORCEMENT

634-1.01 DESCRIPTION. Furnish and install geogrid material at locations shown on the Plans.

634-2.01 MATERIALS. Use materials that conform to the following:

Geogrid	Subsection 729-2.05

CONSTRUCTION REQUIREMENTS

634-3.01 WEATHER LIMITATIONS. Do not expose geogrid to sunlight for longer than 14 days after removal of protective covering.

634-3.02 SURFACE PREPARATION.

1. Very Soft Ground (CBR < 1). Care should be taken to avoid disturbing any surface crust overlying softer soil. In these cases the geogrid should be placed directly on the unprepared subgrade.

   If directed by the Engineer, minimize disturbance of the subgrade by leaving root mats in place, cutting stumps and other projecting vegetation as close and even to the ground surface as practical.

   Swampland, peat, muskeg or marshes may be difficult to smooth grade and/or compact. Create a surface that is as uniformly smooth as possible. Grade or crown the surface for positive drainage away from the construction zone.

2. Firm Ground (CBR 1 – 3). Prepare surface by removal of stumps, brush, boulders, and sharp objects. Fill holes and large ruts, as directed by the Engineer, with material shown on the Plans or as approved by the Engineer.

3. Firm Ground (CBR > 3). Compact and finish subgrade or subbase prior to placement of the geogrid.

634-3.03 GEOGRID PLACEMENT. Unroll geogrid directly onto the prepared ground surface in the direction of advancing construction, parallel to the centerline of the roadway or according to the Plans. Do not drag the geogrid across the subgrade. Install the geogrid in the longest continuous practical length, free from folds, creases or wrinkles. Hold the geogrid in place with pins, staples, sandbags or piles of granular material.

1. Very Soft Ground. Overlap geogrid panels a minimum of 36-inches at all joints with the upper geogrid in the direction that fill will be placed. Tie panels together securely with cable ties or hog rings at 5-feet intervals or as recommended by the manufacturer and approved by the Engineer.

   To limit lateral spreading and separation of overlaps, if approved by the Engineer, the Contractor may unroll the geogrid transversely/perpendicular to the roadway embankment alignment. Overlap the adjacent rolls and tie together with cable ties or hog rings at 5-feet intervals.

2. Soft Ground. Overlap geogrid panels a minimum of 24-inches at all joints with the upper geogrid in the direction that fill will be placed. Tie panels together securely with cable ties or hog rings at 20-feet intervals or as recommended by the manufacturer and approved by the Engineer.

3. Firm Ground. Overlap geogrid panels a minimum of 12-inches at all joints in the direction that fill will be placed. Tie panels together securely with cable ties or hog rings at 20-feet intervals. Hand-tension geogrid and stake to the ground at the edges, overlaps, and in the center of each roll, at 30-feet intervals or as specified on the Plans.

634-3.04 PLACINIG AND SPREADING COVER MATERIAL. Do not operate equipment directly on the unprotected geogrid. Spread fill material in the direction of the fabric overlap. Compact using a smooth drum roller. Do not allow construction equipment to make sudden stops, starts, or turns on the cover material.

1. Very Soft Ground. End-dump material onto previously placed material and spread over the geogrid with a low ground pressure (LGP equates to tire pressure of 4 psf) dozer to the depth permitted. Maintain a minimum depth of 12-inches of cover material at all times between the geogrid and the wheels or tracks of the construction equipment, unless otherwise shown on the Plans or directed by the Engineer. Do not dump material directly on the geogrid. To prevent a mud wave, end-dump fill along the edges of the geogrid to form toe berms or access roads that extend one to two panel widths ahead of the remainder of the embankment fill placement. After constructing the two berms, spread fill in the area between the toe berms by placing material parallel to the alignment and symmetrical from the toe berms inward toward the center to maintain a U-shaped leading edge (i.e., concave outward) to contain the mud wave. Limit height of dumped piles above the geogrid to avoid local bearing failure. Traffic on the first lift should be parallel to the embankment alignment. Do not allow construction equipment to turn on the first lift. Compact the first lift by tracking in place with dozers or end-loaders. Compact with specified compaction equipment once the embankment is at least 2-feet above the geogrid.

2. Soft Ground. End dump material onto previously placed material and spread over the geogrid with a LGP dozer to the depth permitted. Maintain a minimum depth of 6-inches of cover material at all times between the geogrid and the wheels or tracks of the construction equipment unless otherwise shown on the Plans or directed by the Engineer. Place the end-dumped material along the roadway centerline and spread it outward to the roadway edges to prevent the development of wrinkles or movement of the geogrid during construction. Fill in any ruts that form during construction with material shown on the Plans. Do not cut down the fill adjacent to the ruts.

3. Firm Ground. Maintain a minimum depth of 6 inches of cover material at all times between the geogrid and the wheels or tracks of the construction equipment.

634-3.05 GEOGRID REPAIR. If the geogrid is torn, punctured, or the overlaps disturbed – as evidenced by visible geogrid damage – remove the backfill around the damaged area and repair or replace the damaged area. Make repairs to the damaged area with a patch of the same class of geogrid originally placed. Overlay torn area with geogrid with a minimum 3-feet overlap around the edges of the torn area and secure as recommended by the geogrid manufacturer, unless otherwise directed by the Engineer.

634-4.01 METHOD OF MEASUREMENT. Measure geogrid by the square yard of ground surface covered. No allowance will be made for overlap, whether at joints or patches.

634-5.01 BASIS OF PAYMENT. Payment will be made at the Contract unit price. Repair and replacement costs for damaged geogrid are subsidiary to the Section 634 Pay Items.

Material used to fill ruts and holes will be paid for at the unit price for the class of material used.

Payment will be made under:

Coordinate the Class of geogrid with Subsection 729-2.05 and the Materials' Department.

PAY ITEM

Item Number	Item Description	Unit
634.0001.____	Geogrid, Stabilization, Class ___	SY
634.0002.____	Geogrid, Reinforcement, Class ___	SY

CR634-090315R

Replace Section 639 with the following:

SECTION 639
DRIVEWAYS

639-1.01 DESCRIPTION. Construct driveways and approaches.

639-2.01 MATERIALS. Reserved.

639-3.01 CONSTRUCTION. Reserved.

639-4.01 METHOD OF MEASUREMENT. By the number of driveways and approaches constructed.

639-5.01 BASIS OF PAYMENT. The Contract unit price for driveways and approaches is for furnishing equipment and labor.

Pavement removal and excavation required constructing driveways and approaches is subsidiary to the driveway and approach pay items.

Materials required to construct driveways and approaches will be paid for separately under the respective items listed in the bid schedule.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
639.0001.____	Driveway	Each
639.0002.____	Driveway, Residential	Each
639.0003.____	Driveway, Commercial	Each
639.2000.____	Approach	Each

CR639-092016R

Special Provision

Replace Section 641 with the following:

SECTION 641
EROSION, SEDIMENT, AND POLLUTION CONTROL

641-1.01 DESCRIPTION. Provide project administration and Work relating to control of erosion, sedimentation, and discharge of pollutants, according to this section and applicable local, state, and federal requirements, including the APDES Construction General Permit. The state APDES program is administered by DEC. Section 301(a) of the Clean Water Act (CWA) and 18 AAC 83.015 provide that the discharge of pollutants to water of the U.S. is unlawful except as allowed by the CGP.

641-1.02 DEFINITIONS. These definitions apply only to Section 641.

ACTIVE TREATMENT SYSTEM (ATS) OPERATOR. The Contractor's qualified representative who is responsible for maintaining and operating an active treatment system (as defined in the CGP) for storm water runoff.

ALASKA CERTIFIED EROSION AND SEDIMENT CONTROL LEAD (AK-CESCL). A person who has completed training, testing, and other requirements of, and is currently certified as, an AK-CESCL from an AK-CESCL Training Program (a program developed under a Memorandum of Understanding between the Department and others). The Department recognizes AK-CESCLs as "qualified personnel" required by the CGP. An AK-CESCL must be recertified every three years. (See Qualified Person)

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION (DEC). The state agency authorized by EPA to administer the Clean Water Act's National Pollutant Discharge Elimination System.

ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM (APDES). A system administered by DEC that issues and tracks permits for storm water discharges.

BEST MANAGEMENT PRACTICES (BMPS). Temporary or permanent structural and non-structural devices, schedules of activities, prohibition of practices, maintenance procedures, and other management practices to prevent or minimize the discharge of pollutants to waters of the United States. BMPs also include, but are not limited to, treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from material storage.

CLEAN WATER ACT (CWA). Federal Water Pollution Control Amendments of 1972, as amended (33 U.S.C. 1251 et seq.).

CONSTRUCTION ACTIVITY. Physical activity by the Contractor, Subcontractor or utility company; that may result in erosion, sedimentation, or a discharge of pollutants into storm water. Construction Activity includes soil disturbing activities (e.g. clearing, grubbing, grading, excavating); and establishment of construction materials or equipment storage or maintenance areas (e.g. material piles, borrow area, concrete truck chute wash-down, fueling); and industrial activities that may discharge storm water and are directly related to the construction process (e.g. concrete or asphalt batch plants).

CONSTRUCTION GENERAL PERMIT (CGP). The permit authorizing storm water discharges from Construction Activities, issued and enforced by Alaska DEC. It authorizes storm water discharges provided permit conditions and water quality standards are met.

CORPS OF ENGINEERS PERMIT (COE PERMIT). A U.S. Army Corps of Engineers Permit for construction in waters of the US. Such permit may be issued under Section 10 of the Rivers and Harbors Act of 1899, or Section 404 of the Clean Water Act.

ELECTRONIC NOTICE OF INTENT (ENOI). The electronic Notice of Intent submitted to DEC, to obtain coverage under the CGP.

ELECTRONIC NOTICE OF TERMINATION (ENOT). The electronic Notice of Termination submitted to DEC, to end coverage under the CGP.

ENVIRONMENTAL PROTECTION AGENCY (EPA). A federal agency charged to protect human health and the environment.

ERODIBLE STOCKPILE. Any material storage area or stockpile consisting of mineral aggregate, organic material, or a combination thereof, with greater than 5 percent passing the #200 sieve, and any material storage where wind or water transports sediments or other pollutants from the stockpile. Erodible Stockpile also includes any material storage area or stockpile where the Engineer determines there is potential for wind or water transport of sediments or other pollutants away from the stockpile.

EROSION AND SEDIMENT CONTROL PLAN (ESCP). The Department's project specific document that illustrates measures to control erosion and sediment on the project. The ESCP provides bidders with the basis for cost estimating and guidance for developing an acceptable Storm Water Pollutant Prevention Plan (SWPPP).

FINAL STABILIZATION. Is defined in this section as it is defined in the CGP, Appendix C.

HAZARDOUS MATERIAL CONTROL PLAN (HMCP). The Contractor's detailed project specific plan for prevention of pollution from storage, use, transfer, containment, cleanup, and disposal of hazardous material (including, but are not limited to, petroleum products related to construction activities and equipment). The HMCP is included as an appendix to the SWPPP.

INSPECTION. An inspection required by the CGP or the SWPPP, usually performed together by the Contractor's SWPPP Manager and Department's Storm Water Inspector.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT. A DEC storm water discharge permit issued to certain local governments and other public bodies, for operation of storm water conveyances and drainage systems. See CGP for further definition.

MULTI-SECTOR GENERAL PERMIT (MSGP). The Alaska Pollutant Discharge Elimination System General Permit for storm water discharges associated with industrial activity.

LOW-ERODIBLE STOCKPILE. Any material stockpile identified in the CGP definition for Final Stabilization Section 1.b, and includes: riprap, gabion backfill, porous backfill, railroad ballast, and sub-ballast, ditch lining, or fill material with low erodibility. The stockpile shall not have a gradation of more than 5 percent passing the #200 sieve unless approved by an Engineer. There shall be no possibility of sediment transport due to water or wind erosion.

OPERATOR(S). The party or co-parties associated with a regulated activity that has responsibility to obtain permit coverage under the CGP. "Operator" for the purpose of the CGP and in the context of storm water associated with construction activity, means any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or

2. The party has day to day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g. they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

POLLUTANT. Any substance or item meeting the definition of pollutant contained in 40 CFR § 122.2. A partial listing from this definition includes: dredged spoil, solid waste, sediment, sewage, garbage, sewage sludge, chemical wastes, biological materials, wrecked or discarded equipment, rock, sand, cellar dirt and industrial or municipal waste.

PROJECT ZONE. The physical area provided by the Department for Construction. The Project Zone includes the area of highway or facility under construction, project staging and equipment areas, and material and disposal sites; when those areas, routes and sites, are provided by the Contract.

Material sites, material processing sites, disposal sites, haul routes, staging and equipment storage areas; that are furnished by the Contractor or a commercial operator, are not included in the Project Zone.

QUALIFIED PERSON. A person knowledgeable in the principles and practice of erosion and sediment controls. A qualified Person must be certified under the Alaska Certified Erosion and Sediment Control Lead (AK-CESCL) training program. One of the following training and certification programs may substitute for AK-CESCL certification: CPESC, CESSWI, CPSWQ, OR CISEC (CGP, Appendix C).

RECORDS. Any record, report, information, document, or photograph required to be created or maintained pursuant to the requirements of the CGP, the CGP storm water requirements of the Clean Water Act; and applicable local, state, and federal laws and regulations regarding document preservation.

SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN (SPCC PLAN). The Contractor's detailed plan for petroleum spill prevention and control measures that meet the requirements of 40 CFR 112.

SPILL RESPONSE FIELD REPRESENTATIVE. The Contractor's representative with authority and responsibility for managing, implementing, and executing the HMCP and SPCC Plan.

STORM EVENT. A rainfall event that produces more than 0.5-inch of precipitation in 24 hours and that is separated from the previous storm event by at least 3 days of less than 0.1 inch of rain per day.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP). The Contractor's detailed project specific plan to minimize erosion and contain sediment within the Project Zone, and to prevent discharge of pollutants that exceed applicable water quality standards. The SWPPP includes, but is not limited to, amendments, records of activities, inspection schedules, and reports, qualifications of key personnel, and all other documentation, required by the CGP and this specification, and other applicable local, state, and federal laws and regulations.

STORM WATER POLLUTION PREVENTION PLAN TWO (SWPPP2). The Contractor's detailed project specific plan to comply with CGP or MSGP requirements, for Contractor construction-related activities outside the Project Zone.

SUBCONTRACTOR SPILL RESPONSE COORDINATOR. The subcontractor's representative with authority and responsibility for coordinating the subcontractor's activities in compliance with the HMCP and SPCC Plan.

SUBCONTRACTOR SWPPP COORDINATOR. The subcontractor's representative with authority to direct the subcontractor's work, and who is responsible for coordination with the Superintendent and SWPPP Manager, and for the subcontractor's compliance with the SWPPP.

SUPERINTENDENT. The Contractor's duly authorized representative in responsible charge of the work. The Superintendent has responsibility and authority for the overall operation of the Project and for Contractor furnished sites and facilities directly related to the Project.

SWPPP AMENDMENT. A revision or document that adds to, deletes from, or modifies the SWPPP.

SWPPP MANAGER. The Contractor's qualified representative who conducts Inspections, updates SWPPP records, and has authority to suspend work and to implement corrective actions required for CGP compliance.

SWPPP PREPARER. The Contractor's qualified representative who is responsible for developing the initial SWPPP.

TEMPORARY STABILIZATION. Protecting soils from erosion and sediment loss by rainfall, snow melt, runoff, or wind with a temporary vegetative and/or non-vegetative protection cover. Temporary stabilization may include a combination of seeding, geotextiles, mulches, surface tackifiers, rolled erosion control products, low-erodible gravel or paving, or the mentioned BMP's combined together with trackwalking.

UTILITY SPILL RESPONSE COORDINATOR. The Utility's representative with authority and responsibility for coordinating the Utility's activities in compliance with the HMCP and SPCC Plan.

UTILITY SWPPP COORDINATOR. The Utility's representative with authority to direct the Utility's work, and who is responsible for coordination with the Superintendent and SWPPP Manager, and for the Utility's compliance with the SWPPP.

641-1.03 PLAN AND PERMIT SUBMITTALS. For plans listed in Subsection 108-1.03.5 (SWPPP, HMCP, and SPCC), use the Contractor submission and Department review deadlines identified in Subsection 641-1.03.

Partial and incomplete submittals will not be accepted for review. Any submittal that is re-submitted or revised after submission, but before the review is completed, will restart the submittal review timeline. No additional Contract time or additional compensation will be allowed due to delays caused by partial or incomplete submittals, or required re-submittals.

1. Storm Water Pollution Prevention Plan. Submit an electronic copy and three hard copies of the SWPPP to the Engineer for approval. Deliver these documents to the Engineer at least 21 days before beginning Construction Activity. Organize and bind the SWPPP and related documents for submittal according to the requirements of Subsection 641-2.01.2.

   The Department will review the SWPPP submittals within 14 days after they are received. Submittals will be returned to the Contractor, and marked as either "rejected" with reasons listed or as "approved" by the Department. When the submittal is rejected, the Contractor must revise and resubmit the SWPPP. The 14-day review period will restart when the contractor submits an electronic copy and three hard copies of the revised SWPPP to the Engineer for approval.

   After the SWPPP is approved by the Department, the Contractor must sign and certify the approved SWPPP using Form 25D-111. See Subsection 641-1.03.4 for further SWPPP submittal requirements.

2. Hazardous Material Control Plan. The HMCP Template can be found at the following webpage: http://www.dot.state.ak.us/stwddes/dcsconst/pop_constforms.shtml. Submit an electronic copy and three hard copies of the HMCP, as an appendix to the SWPPP, to the Engineer for approval. The HMCP submittal and review timeline, and signature requirements are the same as the SWPPP.

3. Spill Prevention, Control, and Countermeasure Plan. When a SPCC Plan is required under Subsection 641-2.03, submit an electronic copy and three signed hard copies of the SPCC Plan to the Engineer. Deliver these documents to the Engineer at least 21 days before beginning Construction Activity. The Department reserves the right to review the SPCC Plan and require modifications.

4. CGP Coverage. The Contractor is responsible for permitting of Contractor and subcontractor Construction Activities related to the Project. Do not use the SWPPP for Construction Activities outside the Project Zone where the Department is not an operator. Use a SWPPP2 for Construction Activities outside the Project Zone.

   After Department approval of the SWPPP and prior to beginning Construction Activity, submit an eNOI with the required fee to DEC for coverage under the Construction General Permit (CGP). Submit a copy of the signed eNOI and DEC's written acknowledgement (by letter or other document), to the Engineer as soon as practicable and no later than 3 days after filing eNOI or receiving a written response.

Do not begin Construction Activity until the conditions listed in Subsection 641-3.01.1 are completed.

The Department will submit an eNOI to DEC for Construction Activities inside the Project Zone. The Engineer will provide the Contractor with a copy of the Department's eNOI and DEC's written acknowledgment (by letter or other document), for inclusion in the SWPPP.

Before Construction Activities occur, transmit to the Engineer an electronic copy of the approved and certified SWPPP, with signed Delegations of Signature Authorities on Forms 25D-107 and 25D-108, SWPPP Certifications on Forms 25D-111 and 25D-109, both permittee's signed eNOIs and DEC's written acknowledgement.

5. Ending CGP Coverage. Submit an eNOT to DEC within 30 days after the Engineer has determined the conditions listed in Subsection 641-3.01.6 have been met. Submit a copy of the signed eNOT and DEC's acknowledgement letter to the Department within 3 days of filing the eNOT or receiving a written response.

6. DEC SWPPP Review. When CGP Part 2.1.3, requires DEC SWPPP review:

   a. Transmit a copy of the Department-approved SWPPP to DEC using delivery receipt confirmation;

   b. Transmit a copy of the delivery receipt confirmation to the Engineer within 7 days of receiving the confirmation; and

   c. Retain a copy of delivery receipt confirmation in the SWPPP.

7. Local Government SWPPP Review. When local government or the CGP Part 2.1.4, requires local government review:

   a. Transmit a copy of the Department-approved SWPPP and other information as required to local government, with the required fee. Use delivery receipt confirmation;

   b. Transmit a copy of the delivery receipt confirmation to the Engineer within 7 days of receiving the confirmation;

   c. Transmit a copy of any comments by the local government to the Engineer within 7 days of receipt;

   d. Amend the SWPPP as necessary to address local government comments and transmit SWPPP Amendments to the Engineer within 7 days of receipt of the comments;

   e. Include a copy of local government SWPPP review letter in the SWPPP; and

   f. File a notification with local government that the project is ending.

8. Modifying Contractor's eNOI. When required by the CGP Part 2.7, modify your eNOI to update or correct information within 30 calendar days of the change. Reasons for modification include a change in start or end dates, change in Owner/Operator address and contact information, change in site information, any changes in number of acres to be disturbed, change in decision to use or not use treatment chemicals, or change in location of SWPPP records.

   The Contractor must submit an eNOT and then submit a new eNOI instead of an eNOI modification when: the operator has changed.

641-1.04 PERSONNEL QUALIFICATIONS. Provide documentation in the SWPPP that the individuals serving in these positions meet the personnel qualifications.

1. The SWPPP Preparer.

   a. Total disturbed acreage, 20 acres or less, must meet at least one of the following qualifications:

      (1). Current certification as a Certified Professional in Erosion and Sediment Control (CPESC);

(2). Current certification as AK-CESCL, and at least two years' experience in erosion and sediment control, as a SWPPP Manager or SWPPP writer, or equivalent. Provide documentation including project names, project timelines, and work responsibilities demonstrating the experience requirement; or

(3). Professional Engineer registered in the State of Alaska with current certification as AK-CESCL.

b. Total disturbed acreage greater than 20 acres, must meet Subsection 641-1.04.1.a. above, and complete a SWPPP Preparation course.

2. The Superintendent must meet the following qualifications:

a. Current certification as AK-CESCL; and

b. Duly authorized representative, as defined in the CGP, Appendix A, Part 1.12.3.

3. The SWPPP Manager must have current certification as AK-CESCL. The SWPPP Manager must meet the experience, and authority requirements identified in the CGP for the Storm Water Lead and Storm Water Inspector positions.

4. The Active treatment System (ATS) operator must have current certification as AK-CESCL, and be knowledgeable in the principles and practices of treatment systems in general, and the operation of the project-specific ATS. The ATS operator must have at least three months field experience with ATS, or completion of an ATS manufacturer's training course, or completion of system operator certification course.

5. The Department accepts people having any of the following certificates as equivalent to AK-CESCL, if the certificates are current according to the sponsoring organization's policies:

a. CPESC, Certified Professional in Erosion and Sediment Control; or

b. CISEC, Certified Inspector in Sediment and Erosion Control.

641-1.05 SIGNATURE/CERTIFICATION REQUIREMENTS AND DELEGATIONS.

1. eNOI and eNOT. The eNOI and eNOT must be signed and certified by a responsible corporate officer according to CGP Appendix A, Part 1.12. Signature and certification authority for the eNOI and eNOT cannot be delegated.

2. Delegation of Signature Authority for Other SWPPP Documents and Reports. Use Form 25D-108 to delegate signature authority and certification authority to the Superintendent position, according to CGP Appendix A, Part 1.12.3, for the SWPPP, Inspection Reports and other reports required by the CGP. The Superintendent position is responsible for signing and certifying the SWPPP, Inspection Reports, and other reports required by the CGP, except the eNOI and eNOT.

   The Engineer will provide the Department's delegation on Form 25D-107, which the Contractor must include in the SWPPP.

3. Subcontractor Certification. Subcontractors must certify on Form 25D-105, that they have read and will abide by the CGP and the conditions of the project SWPPP.

4. Signatures and Initials. Handwrite signatures or initials on CGP documents and SWPPP forms, wherever a signature or initial is required.

641-1.06 RESPONSIBILITY FOR STORM WATER PERMIT COVERAGE.

1. The Department and the Contractor are jointly responsible for permitting and permit compliance within the Project Zone.

2. The Contractor is responsible for permitting and permit compliance outside the Project Zone. The Contractor has sole responsibility for compliance with DEC, COE, and other applicable federal, state, and local requirements, and for securing all necessary clearances, rights, and permits. Subsection 107-1.02 describes the requirement to obtain permits, and to provide permit documents to the Engineer.

   An entity that owns or operates, a commercial plant (as defined in Subsection 108-1.01.4) or material source or disposal site outside the Project Zone, is responsible for permitting and permit compliance. The Contractor has sole responsibility to verify that the entity has appropriate permit coverage.

3. Subsection 107-1.02 describes the requirement to obtain permits, and to provide permit documents to the Engineer.

4. The Department is not responsible for permitting or permit compliance, and is not liable for fines resulting from noncompliance with permit conditions:

   a. For areas outside the Project Zone;

   b. For Construction Activity and Support Activities outside the Project Zone; and

   c. For commercial plants, commercial material sources, and commercial disposal sites.

641-2.01 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS.

1. SWPPP Preparer and Pre-Construction Site Visit.

   Use a SWPPP Preparer to develop the SWPPP and associated documents, according to the requirements of the CGP and COE permit. The SWPPP Preparer must put their name, qualifications (including the expiration date of any certifications), title and company name in the SWPPP.

   The SWPPP Preparer must conduct a pre-construction inspection at the Project site before construction activity begins. If the SWPPP Preparer is not a Contractor employee, the SWPPP Preparer must visit the site accompanied by the Contractor. Give the Department at least 7 days advance notice of the site visit, so that the Department may participate.

   During the pre-construction inspection, the SWPPP Preparer must identify, or if a draft of the SWPPP has already been prepared verify that the SWPPP fully addresses and describes:

   a. Opportunities to phase construction activities;

   b. Appropriate BMPs and their sequencing; and

   c. Sediment controls that must be installed prior to beginning Construction Activities.

   Document the SWPPP Preparer's pre-construction inspection in the SWPPP on Form 25D-106, SWPPP Pre-Construction Site Visit, including the names of attendees and the date.

2. Developing the SWPPP.

Use the Department's project ESCP, Environmental commitments, and other Contract documents as a starting point for developing the SWPPP. The approved SWPPP replaces the ESCP.

Develop the SWPPP with sections and appendices, according to the current DOT&PF SWPPP template. Include information required by the Contract and described in the CGP Part 5.0.

a. Obtain the following forms after they have been completed by the Department and include them in the SWPPP:

(1) SWPPP Delegation of Signature Authority – DOT&PF (25D-107)

(2) SWPPP Certification for DOT&PF (25D-109)

(3) SWPPP Delayed Action Item Report (25D-113), if needed

b. Use the following Department forms for recording information in the SWPPP:

(1) SWPPP Amendment Log (25D-114)

(2) SWPPP Certification for Contractor (25D-111)

(3) SWPPP Construction Site Inspection Report (25D-100)

(4) SWPPP Corrective Action Log (25D-112)

(5) SWPPP Daily Record of Rainfall (25D-115)

(6) SWPPP Delegation of Signature Authority – Contractor (25D-108)

(7) SWPPP Grading and Stabilization Activities Log (25D-110)

(8) SWPPP Pre-Construction Site Visit (25D-106)

(9) SWPPP Project Staff Tracking (25D-127)

(10) SWPPP Subcontractor Certification (25D-105)

(11) SWPPP Training Log (25D-125)

(12) SWPPP Noncompliance (25D-143)

SWPPP Template forms and instructions are available online at:

http://www.dot.state.ak.us/stwddes/dcsconst/pop_constforms.shtml

Compile the SWPPP in three ring binders with tabbed and labeled dividers for each section and appendix.

3. SWPPP Considerations and Contents.

a. The SWPPP must provide erosion and sediment control measures for all Construction Activity within the Project Zone. Construction activity outside the Project Zone must have permit coverage, using a separate SWPPP2, and separate Contractor Inspections.

b. The SWPPP must consider the activities of the Contractor and all subcontractors and utility companies performing work in the Project Zone. The SWPPP must describe the roles and responsibilities of the Contractor, subcontractors, utility companies, and the Department with regard to implementation of the SWPPP. The SWPPP must identify all operators for the Project, including utility companies performing Construction Activity, and identify the areas:

   (1) Over which each operator has operational control; and

   (2) Where the Department and Contractor are co-operators.

c. For work outside the Project Zone the SWPPP must identify the entity that has storm water permit coverage, the operator, and the areas that are:

   (1) Dedicated to the Project and where the Department is not an operator; and

   (2) Not dedicated to the project, but used for the project.

d. Account for the Contractor's construction methods and phasing. Identify the amount of mean annual precipitation.

e. Comply with the CGP Part 1.4.3 Authorized Non-Storm Water Discharges. List locations where authorized non-storm water will be used, including the types of water that will be used on-site.

f. Include the Department's Antidegradation Analysis in the SWPPP if storm water from the Project Zone discharges into receiving water that is considered a high quality water and that constitutes an outstanding national resource, according to CGP Part 2.1.6.

g. Where the project intersects a Public Water System (PWS), the Engineer will notify the PWS contact for the Department and Contractor according to the CGP Part 4.10. Contractor Amend a copy of the communications in Appendix Q.

h. There are special requirements in the CGP Part 3.2, for storm water discharges into an impaired water body, and they may include monitoring of storm water discharges. For Projects meeting the permit criteria, the Contractor shall implement a monitoring plan approved by the Department for the storm water within the Project Zone, and shall provide the required information and reports for inclusion in the SWPPP. The Contractor is responsible for monitoring and reporting outside the Project Zone.

i. Preserve natural topsoil unless infeasible. Delineate the site according to CGP Part 4.2.1. Use stakes, flags, or silt fence, etc. to identify areas where land disturbing activities will occur and areas that will be left undisturbed. Minimize the amount of soil exposed during Construction activity according to CGP Part 4.2.2.

j. Comply with CGP Part 4.4, and the DEC General Permit for Excavation Dewatering (AKG002000), requirements for dewatering for trenches and excavations.

k. The SWPPP must identify specific areas where potential erosion, sedimentation, or pollution may occur. The potential for wind erosion must be addressed. The potential for erosion at drainage structures must be addressed.

l. Describe methods and time limits, to initiate temporary or final soil stabilization, CGP Part 4.5.1.1. Begin stabilization no later than the end of the next work day, following the day when the earth-disturbing activities have permanently ceased on any portion of the site or temporarily ceased on any portion of the site and will not resume for a period exceeding:

   (1) 7 days for areas with mean annual precipitation 40 inches or greater; or

   (2) 14 days for areas with mean annual precipitation less than 40 inches.

   Time allotted to complete temporary and final stabilization, Subsection 641-2.01, 3.m.

m. Within 7 days of initiating final stabilization, CGP Part 4.5.1.4, either complete final stabilization or continue maintenance of work until final stabilization is complete. Complete temporary stabilization within 14 days of initiating stabilization, CGP Part 4.5.1.2.

n. Include in the “Stabilize Soils” section of the SWPPP, a description of how you will minimize the amount of disturbed and unstabilized ground in the fall season. Identify anticipated dates of fall freeze-up and spring thaw. Describe how you will stabilize areas when it is close to or past the seasonal time of snow cover or frozen conditions, and before the first seasonal thaw. Include a plan for final stabilization.

o. Plans for Active Treatment Systems must be submitted to DEC for review at least 14 days prior to use of the system and the Operator of the ATS identified in the SWPPP. Any use of treatment chemicals must be identified on the NOI, documented in the SWPPP, and meet with the requirements in the CGP Part 4.6.

p. The SWPPP must provide designated areas for equipment and wheel washing, equipment fueling and maintenance, chemical storage, staging or material storage, waste or disposal sites, concrete washouts, paint and stucco washouts, and sanitary toilets. These activities must be done in designated areas that are located, to the extent practicable, away from drain inlets, conveyance channels, and waters of the US. No discharges are allowed from concrete washout, paint and stucco washout; or from release oils, curing compounds, fuels, oils, soaps, and solvents. Equipment and wheel washing water that doesn’t contain detergent may be discharged on-site if it is treated before discharge.

q. Design temporary BMPs for a 2 year 24 hour precipitation amount. Describe BMPs in the SWPPP and in SWPPP Amendments, including source controls, sediment controls, discharge points, and temporary and final stabilization measures. Describe the design, placement, installation, and maintenance of each BMP, using words, and drawings as appropriate. Describe the design capacity of sediment basins (including sediment ponds and traps). Provide a citation to the BMP Manual or publication used as a source for the BMP, including the manufacturer's or BMP manual specifications for installation (CGP Part 5.3.6.2). If no published source was used to select or design a BMP, then the SWPPP or SWPPP amendment must state that “No BMP manual or publication was used for this design.”

r. Describe the sequence and timing of activities that disturb soils and of BMP implementation and removal. Phase earth-disturbing activities to minimize unstabilized areas, and to achieve temporary or final stabilization quickly. Whenever practicable incorporate final stabilization work into excavation, embankment, and grading activities. Include drawings showing each phase of the project with the BMPs implemented in the Phase.

s. Provide a legible site map or set of maps in the SWPPP, showing the entire site and identifying boundaries of the property where construction and earth-disturbing activities will occur, as described in the CGP Part 5.3.5. Include all BMPs on the site map.

t. Identify the inspection frequency in the SWPPP:

   (1) Inspect once every 7 calendar days regardless of the precipitation amount.

u. Linear Project Inspections, described in CGP Part 6.5, are not applicable to this contract.

v. The SWPPP must cite and incorporate applicable requirements of the Project permits, environmental commitments, COE permit, and commitments related to historic preservation. Make additional consultations or obtain permits as necessary for Contractor specific activities that were not included in the Department’s permitting and consultation.

w. The SWPPP is a dynamic document. Keep the SWPPP current by noting installation, modification, and removal of BMPs, and by using amendments, SWPPP amendment logs, Inspection Reports, corrective action logs, records of land disturbance and stabilization, and any other records necessary to document storm water pollution prevention activities and to satisfy the requirements of the CGP and this specification. See Subsection 641-3.03 for more information.

4. Recording Personnel and Contact Information in the SWPPP.

Identify the SWPPP Manager as the Storm Water Lead and Storm Water Inspector positions in the SWPPP. Document the SWPPP Manager's responsibilities in Section 2.0 Storm Water Contacts, of the SWPPP template and:

a. Identify that the SWPPP Manager does not have authority to sign inspection reports (unless the SWPPP Manager is also the designated project Superintendent).

b. Identify that the SWPPP Manager cannot prepare the SWPPP unless the SWPPP Manager meets the Contract requirements for the SWPPP Preparer.

Include in the SWPPP, proof of AK-CESCL, or equivalent certifications for the Superintendent and SWPPP Manager, and for any acting Superintendent and acting SWPPP Managers. If the Superintendent or SWPPP Manager is replaced permanently or temporarily, by an acting Superintendent or acting SWPPP Manager, record in the SWPPP (use Form 25D-127) the names of the replacement personnel, the date of the replacement. For temporary personnel record their beginning and ending dates.

Provide 24-hour contact information for the Superintendent and SWPPP Manager. The Superintendent and SWPPP Manager must have 24-hour contact information for all Subcontractor SWPPP Coordinators and Utility SWPPP Coordinators.

Include in the SWPPP, proof of AK-CESCL, or equivalent certifications of ATS operators. Record the names of ATS operators and their beginning and ending dates, on Form 25D-127.

The Department will provide proof of AK-CESCL, or equivalent certifications for the Department's Project Engineer, Storm Water Inspectors, and Monitoring Person (if applicable), and names and dates they are acting in that position. Include the Department's staff certifications in Appendix E. Include the Department's staff names, dates acting, and assignments, in Section 2.0 of the SWPPP.

641-2.02 HAZARDOUS MATERIAL CONTROL PLAN (HMCP) REQUIREMENTS.

1. Prepare the HMCP using the DOT&PF template located at the following DOT&PF link; (http://www.dot.state.ak.us/stwddes/dcsconst/pop_constforms.shtml) for prevention of pollution from storage, use, containment, cleanup, and disposal of all hazardous material, including petroleum products related to construction activities and equipment. Include the HMCP as an appendix to the SWPPP. Compile Material Safety Data Sheets in one location and reference that location in the HMCP.

2. Designate a Contractor's Spill Response Field Representative with 24 hour contact information. Designate a Subcontractor Spill Response Coordinator for each subcontractor. The Superintendent and Contractor's Spill Response Field Representative must have 24-hour contact information for each Subcontractor Spill Response Coordinator and the Utility Spill Response Coordinator.

3. List and give the location and estimated quantities of hazardous materials (Including materials or substances listed in 40 CFR 117 and 302, and petroleum products) to be used or stored on the Project. Hazardous materials must be stored in covered storage areas. Include secondary containment for all hazardous material storage areas.

4. Identify the locations where fueling and maintenance activities will take place, describe the activities, and list controls to prevent the accidental spillage of petroleum products and other hazardous materials. Controls include placing absorbent pads or other suitable containment under fill ports while fueling, under equipment during maintenance or repairs, and under leaky equipment.

5. List the types and approximate quantities of response equipment and cleanup materials available on the Project. Include a list and location map of cleanup materials, at each different work site and readily available off site (materials sources, material processing sites, disposal sites, staging areas, etc.). Spill response materials must be stored in sufficient quantity at each work location, appropriate to the hazards associated with that site.

6. Describe procedures for containment and cleanup of hazardous materials. Describe a plan for the prevention, containment, cleanup, and disposal of soil and water contaminated by spills. Describe a plan for dealing with contaminated soil and water encountered during construction. Clean up spills or contaminated surfaces immediately.

7. Describe methods of disposing of waste petroleum products and other hazardous materials generated by the Project, including routine maintenance. Identify haul methods and final disposal areas. Assure final disposal areas are permitted for hazardous material disposal.

8. Describe methods of complying with the requirements of AS 46.04.010-900, Oil and Hazardous Substances Pollution Control, and 18 AAC 75. Include contact information for reporting hazardous materials and petroleum product spills to the Project Engineer and reporting to federal, state and local agencies.

641-2.03 SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN (SPCC Plan) REQUIREMENTS. Prepare and implement an SPCC Plan when required by 40 CFR 112; when both of the following conditions are present on the Project:

1. Oil or petroleum products from a spill may reach navigable waters (as defined in 40 CFR 112); and

2. Total above ground storage capacity for oil and any petroleum products is greater than 1,320 gallons (not including onboard tanks for fuel or hydraulic fluid used primarily to power the movement of a motor vehicle or ancillary onboard oil-filled operational equipment, and not including containers with a storage capacity of less than 55 gallons)

Reference the SPCC Plan in the HMCP and SWPPP.

641-2.04 RESPONSIBILITY AND AUTHORITY OF THE SUPERINTENDENT AND SWPPP MANAGER.

The Superintendent is responsible for the overall operation of the Project and all Contractor furnished sites and facilities directly related to the Project. The Superintendent shall sign and certify the SWPPP, Inspection Reports, and other reports required by the CGP, except the NOI and NOT. The Superintendent may not delegate the task or responsibility of signing and certifying the SWPPP submitted under Subsection 641-1.03.1, Inspection Reports, and other reports required by the CGP.

The Superintendent may assign certain duties to the SWPPP Manager.

1. Ensuring Contractor’s and subcontractor’s compliance with the SWPPP and CGP;

2. Ensuring the control of erosion, sedimentation, or discharge of pollutants;

3. Directing and overseeing installation, maintenance, and removal of BMPs;

4. Performing Inspections; and

5. Updating the SWPPP including adding amendments and forms.

When Bid Item 641.0007.____ is part of the Contract, the SWPPP Manager must be available at all times to administer SWPPP requirements, and be physically present within the Project Zone or the project office, for at least eight hours per day when construction activities are occurring.

The Superintendent and SWPPP Manager shall be knowledgeable in the requirements of this Section 641, the SWPPP, CGP, BMPs, HMCP, SPCC Plan, environmental permits, environmental commitments, and historic preservation commitments.

The Superintendent and SWPPP Manager shall have the Contractor's complete authority and be responsible for suspending construction activities that do not conform to the SWPPP or CGP.

641-2.05 MATERIALS. Use materials suitable to withstand hydraulic, wind, and soil forces, and to control erosion and trap sediments according to the requirements of the CGP and the Specifications.

Use the temporary seed mixture specified, and if not specified as directed.

Use soil stabilization material as specified in Section 727.

Use silt fences as specified in Section 729.

Use straw and straw products certified weed free of prohibited and restricted noxious weed seed and quarantined pests, according to Alaska Administrative Code, Title 11, Chapter 34 (11 AAC 34). When straw or straw products certified according to 11 AAC 34 are not available, use non-certified products manufactured within Alaska before products manufactured in another state, country or territory. Grass, legumes, or any other herbaceous plants produced as hay, shall not be substituted for straw, or straw products.

Use Oregon Scientific RGR126 wireless rain gauge with temperature, or Taylor 2751 Digital Wireless Rain Gauge with Thermometer, or approved equivalent.

641-3.01 CONSTRUCTION REQUIREMENTS. Comply with the SWPPP and the requirements of the CGP Part 5.0.

1. Before Construction.

   The following actions must be completed before Construction Activity begins:

   a. The SWPPP Preparer must visit the Project, the visit must be documented in the SWPPP Form (25D-106), and the SWPPP must be developed (or amended) with findings from the visit;

   b. The SWPPP must be approved by the Engineer on Form 25D-109;

   c. The Contractor must be authorized to begin by the Engineer;

   d. The Project eNOIs for the Department and for the Contractor, as well as any other eNOIs if there are additional operators, must be listed as Active Status on the DEC website;

   e. The Department approved SWPPP must be submitted to DEC and Local Government (when required); and

   f. The Contractor has transmitted to the Engineer an electronic copy, and at least one hardcopy of the approved SWPPP.

   g. The Delegation of Authority (Forms 25D-108 and 25D-107) for both the Contractor and DOT&PF Engineer are signed.

h. Begin winter construction activity according to CGP Part 4.12.2, provided actions a, c, and g are completed. If winter construction activities may extend beyond spring thaw, the following actions must be completed before spring thaw:

(1) Actions a through g, listed above, and

(2) Appropriate control measures to minimize erosion and sediment runoff during spring thaw and summer rainfall are installed.

i. Post notices.

Include the following information:

(1) Copy of all eNOIs related to this project;

(2) Location of the SWPPP.

Post notices on the outside wall of the Contractor's project office, and near the main entrances of the construction project. Protect postings from the weather. Locate postings so the public can safely read them without obstructing construction activities or the traveling public (for example, at an existing pullout). Do not use retroreflective signs for the SWPPP posting. Do not locate SWPPP signs in locations where the signs may be confused with traffic control signs or devices. Update the notices if the listed information changes.

J. Install an outdoor rain gauge per manufacturer's guidance in a readily accessible location on the Project. Projects may utilize the nearest National Weather Service (NWS) precipitation gauge station, if within 20 miles of the project, to determine rainfall amounts during storm events.

k. Delineate the site for both land disturbing activities and areas that will be left undisturbed.

l. Install sediment controls and other BMPs that must be placed prior to the initiation of Construction Activity.

2. <u>During Construction</u>.

Before subcontractors or utility companies begin soil-disturbing activities, provide to them copies of applicable portions of the SWPPP, and require them to sign a SWPPP Subcontractor Certification, Form 25D-105. Include SWPPP Subcontractor Certifications as an appendix to the SWPPP. Ensure subcontractors and utility companies understand and comply with the SWPPP and the CGP. Inform subcontractors and utility companies of SWPPP amendments that affect them in a timely manner. Coordinate with subcontractors and utility companies doing work in the Project Zone so BMPs, including temporary and final stabilization are installed, maintained, and protected from damage.

Provide on-going training to employees and subcontractors, on control measures at the site and applicable storm water pollution prevention procedures. Training must be specific to the installation, maintenance, protection, and removal of control measures CGP 4.14. Training must be given at a frequency that will be adequate to ensure proper implementation and protection of control measures, and no less frequently than once a month during construction activity. Document on the SWPPP Training Log, Form 25D-125, the dates and attendees to these trainings. Include the SWPPP Training Log as an appendix to the SWPPP.

Notify the Engineer immediately if the actions of any utility company or subcontractor do not comply with the SWPPP and the CGP.

Comply with Subsection 107-1.11 Protection and Restoration of Property and Landscape. Concrete washout must be fully contained.

Comply with CGP Part 4.8.2 for fueling and maintenance activities. Place absorbent pads or other suitable containment under fill ports while fueling, under equipment during maintenance or repairs, and under leaky equipment.

Comply with requirements of the HMCP and SPCC Plan, and all local, state, and federal regulations that pertain to the handling, storage, containment, cleanup, and disposal of petroleum products or other hazardous materials.

Keep the SWPPP and HMCP current (refer to Subsection 641-2.01.3, SWPPP Considerations and Contents)

3. Pollutant and Hazardous Materials Reporting Requirements.

If an incident of non-compliance occurs that may endanger health or the environment a report must be made, CGP, Appendix A, Part 3.4:

a. Orally report to the Engineer as soon as the permittee becomes aware of the incident,

b. Orally report to DEC within 24 hours after the permittee becomes aware of the incident, and

c. In writing, report to DEC within 5 days after the permittee becomes aware of the circumstances. To report in writing, complete the written noncompliance report on Form 25D-143, and file the written report with DEC. Coordinate the report with the Engineer. Include in the report:

(1) A description of the noncompliance and its causes;

(2) The exact dates and times of noncompliance;

(3) If not yet corrected the anticipated time the project will be brought back into compliance; and

(4) The corrective action taken or planned to reduce, eliminate and prevent reoccurrence.

Notify the Engineer and COE Regulatory Program as soon as the permittee becomes aware of an incident of noncompliance with COE Permits.

Report spills of petroleum products or other hazardous materials to the Engineer as soon as the permittee becomes aware of the incident, the DEC (CGP Part 9.3), and other agencies as required by law. Use the HMCP and SPCC Plan (if available) for contact information to report spills to regulatory agencies.

4. Corrective Action and Maintenance of BMPs.

Implement maintenance as required by the CGP, SWPPP, and manufacturer's specifications, whichever is more restrictive.

a. Implement corrective action:

(1) If an incident of noncompliance with the SWPPP, or CGP is identified;

(2) If an Inspection or the Engineer identifies the SWPPP or any part of the SWPPP is ineffective in preventing erosion, sedimentation or the discharge of pollutants;

(3) If a required BMP was not installed according to the SWPPP schedule or phasing, or was installed incorrectly, or was not installed according to the CGP Part 4.0;

(4) If a BMP is not operating as intended, has not been maintained in an effective operation condition, or is unable to effectively perform the intended function;

(5) If sediment accumulates more than one-third of the distance of the above-ground height of the silt fence;

(6) If sediment accumulates to more than one-half retention height for an inlet BMP, check dam, berm, wattle, or other control measures;

(7) If a prohibited discharge of pollutants, as specified in CGP Part 4.7, is occurring or will occur; or

(8) If there is accumulation of sediment or other pollutants, that is in or near any storm water conveyance channels, or that may enter a discharge point or storm sewer system. If there is accumulation of sediment or other pollutants that is being tracked outside the project zone.

b. Implement corrective actions so that they comply with the following time requirements:

(1) For conditions that are easily remedied (i.e. removal of tracked sediment, maintenance of control measure, or spill clean-up), initiate corrective action within 24 hours and complete as soon as possible;

(2) If a discharge occurs during a local 2-year, 24-hour storm event, initiate a corrective action the day after the storm event ends;

(3) If installation of a new control measure is needed or an existing control measure requires redesign and reconstruction or replacement to make it operational, the corrective action must be completed within 7 calendar days from the time discovered.

(4) For all other conditions initiate corrective actions so both of the following requirements are met:

(a) Corrective action is completed in time to protect water quality; and

(b) Corrective action is completed no later than the Complete-by-Date that was entered in an Inspection Report (see Subsection 641-3.03.2 for more information).

If a corrective action is not implemented within the time requirements of this section, document the situation in the SWPPP, notify the Engineer, and implement corrective action as soon as possible.

If a corrective action could affect a subcontractor, notify the subcontractor within 3 days of taking the corrective action. Require in your written subcontract, that subcontractors must notify the Contractor within 24 hours of becoming aware of a condition that requires a corrective action.

5. Stabilization.

a. Stabilization may be accomplished using temporary or permanent measures. Initiate stabilization of disturbed soils, erodible stockpiles, disposal sites, and of erodible aggregate layers so that all of the following conditions are satisfied:

(1) Not later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased (CGP Part 4.5.1.1, Note:).

(2) As soon as necessary to avoid erosion, sedimentation, or the discharge of pollutants; and

(3) As identified in the SWPPP.

b. Land may be disturbed and stabilized multiple times during a project. Coordinate work to minimize the amount of disturbed soil at any one time. Do not disturb more soil than you can stabilize with the resources available.

c. Temporarily stabilize from wind and water erosion portions of disturbed soils, portions of stockpiles, and portions of disposal sites, that are not in active construction. Temporary stabilization measures may require a combination of measures including but not limited to vegetative cover, mulch, stabilizing emulsions, blankets, mats, soil binders, low-erodible cover, dust palliatives, or other approved methods.

d. When temporary or permanent seeding is required, provide a working hydro seeding equipment located within 100 miles of the project by road; with 1,000 gallon or more tank capacity, paddle agitation of tank, and the capability to reach the seed areas with an uniform mixture of water, seed, mulch and tackifier. If the project is located in an isolated community, the hydro-seeder must be located at the project.

e. Before applying temporary or permanent seeding, prepare the surface to be seeded to reduce erosion potential and to facilitate germination and growth of vegetative cover. Apply seed and maintain seeded areas. Reseed areas where growth of temporary vegetative cover is inadequate to stabilize disturbed ground.

f. Apply permanent seed according to Sections 618 and 724, within the time periods allowed by the CGP and the contract, at locations where seeding is indicated on the plans and after land-disturbing activity is permanently ceased.

g. When installing a culvert or other drainage structure where stream bypass is not used, install temporary, or final stabilization concurrently or immediately after placing the culvert or drainage structure in a manner that complies with the SWPPP, applicable project permits and prevents discharge of pollutants. Install temporary or final stabilization:

   (1) At the culvert or drainage structure inlet and outlet; and

   (2) In the areas upstream and downstream that may be disturbed by the process of installing the culvert, culvert end walls, culvert end sections, or drainage structure.

h. Before deactivating a stream bypass or stream diversion used for construction of a bridge, culvert, or drainage structure, install final or temporary stabilization when approved by the Engineer:

   (1) At the inlet and outlet of the culvert, drainage structure, or bridge;

   (2) In the area upstream and downstream of the culvert, drainage structure, or bridge, that is disturbed during installation or construction of the culvert, drainage structure, or bridge; and

   (3) Under the bridge.

Within 7 days of initiating final stabilization, either complete final stabilization or continue maintenance of work until final stabilization is complete, CGP Part 4.5.1.5,

Complete temporary stabilization within 14 days of initiating stabilization, CGP Part 4.5.1.2.

6. Ending CGP Coverage and BMP Maintenance in the Project Zone.

a. The Engineer will determine the date that all the following conditions for ending CGP coverage have been met within the Project Zone:

   (1) Land disturbing activities have ceased;

   (2) Final Stabilization has been achieved on all portions of the Project Zone, according to the CGP PART 4.5.2 (including at Department furnished material sources, disposal sites, staging areas, equipment areas, etc.); and

(3) Temporary BMPs have been removed.

b. After the Engineer has determined the conditions for ending CGP coverage have been met, the Department will:

(1) Send written notice to the Contractor with the date that the conditions were met;

(2) Submit an eNOT to DEC; and

(3) Provide a copy of the eNOT and DEC's acknowledgement letter to the Contractor.

The Contractor is responsible for ending permit coverage within the Project Zone, by submitting an eNOT to DEC within 30 days of meeting the conditions for ending CGP coverage. The Contractor is responsible for BMP maintenance and SWPPP updates until permit coverage is ended.

If the Contractor's CGP eNOI acreage includes Support Activities and any other areas where the Department is not an Operator, the Contractor may not be able to file an eNOT at the same time as the Department. In this case, the Contractor must amend the SWPPP and separate SWPPP2(s), to indicate the Department's CGP coverage has ended, and the Department is no longer an Operator within the Project Zone.

The Contractor must indicate in the SWPPP the areas that have reached Final Stabilization, and the dates land disturbing activities ended and Final Stabilization was achieved. The Contractor must submit an eNOT to DEC, and insert copies of the Department's and the Contractor's eNOTs with DEC's acknowledgement letters in the appendix of the SWPPP.

The Contractor must submit a copy of each signed eNOT and DEC's acknowledgement letter to the Department within 3 days of filing the eNOT or receiving a written response.

The Contractor is responsible for coordinating local government inspections of work and ending permit coverage with local government. See Subsection 641-1.03.5 for more information.

7. Transmit final SWPPP.

Transmit one copy of the final SWPPP, including all amendments, appendices, and maps, to the Engineer; when the project eNOTs are filed, or within 30 days of the Department's eNOT being filed, whichever is sooner. Transmittal must be by both electronic and at least one hard copy.

641-3.02 SWPPP DOCUMENTS, LOCATION ON-SITE, AVAILABILITY, AND RECORD RETENTION.

The SWPPP and related documents maintained by the Contractor are the Record for demonstrating compliance with the CGP. Copies of SWPPP documents transmitted to the Engineer under the requirements of this specification are informational and do not relieve the Contractor's responsibility to maintain complete records as required by the CGP and this specification.

Keep the SWPPP, HMCP, and SPCC Plan at the on-site project office. If there is not an on-site project office, keep the documents at a locally available location that meets CGP requirements and is approved by the Engineer. Records may be moved to another office for record retention after the eNOTs are filed. Records may be moved to another office during winter shutdown. Update on-site postings if records are relocated during winter shutdown. Provide the Department with copies of all Records.

Retain Records and a copy of the SWPPP, for at least three years after the date of eNOT. If EPA or DEC inspects the project, issues a Notice of Violation (NOV), or begins investigation for a potential NOV before the retention period expires, retain the SWPPP and all Records related to the SWPPP and CGP until at least three years after EPA and/or DEC has determined all issues related to the investigation are settled.

The SWPPP and related documents must be made available for review and copy, to the Department and other regulatory agencies that request them. See CGP Parts 5.10, 6.6 and 9.5.

641-3.03 SWPPP INSPECTIONS, AMENDMENTS, REPORTS, AND LOGS. Perform Inspections, prepare Inspection Reports, and prepare SWPPP Amendments in compliance with the SWPPP and the CGP. Update SWPPP Corrective Action Log Form 25D-112, SWPPP Amendment Log Form 25D-114, SWPPP Grading and Stabilization Activities Log Form 25D-110, SWPPP Project Staff Tracking Form 25D-127, and SWPPP Daily Record of Rainfall Form 25D-115. For active projects update the Records daily.

1. Inspection during Construction.

   Conduct Inspections according to the schedule and requirements of the SWPPP and CGP.

   Inspections required by the CGP and SWPPP must be performed by the Contractor's SWPPP Manager and the Department's Storm Water Inspector jointly, unless approved by the Engineer, when:

   a. One of the inspectors is not on site, access is only by air, and weather delayed or canceled flights;

   b. One of the inspectors is sick;

   c. The project is on a reduced frequency inspection schedule with no staff on site, the only access to the site is by air, and it is economical to send only one inspector; or

   d. When the Engineer determines a safety concern that makes joint inspection impracticable.

   When this is the case, the Operator who conducts the Inspection must provide a copy of the Inspection Report to the other Operator within 3 days of the Inspection date and document the date of the report transmittal.

2. Inspection Reports.

   Use only the DOT&PF SWPPP Construction Site Inspection Report, Form 25D-100 to record Inspections. Changes or revisions to Form 25D-100 are not permitted; except for adding or deleting data fields that list: Location of Discharge Points, and Site Specific BMPs. Complete all fields included on the Inspection Report form; do not leave any field blank.

   Insert a Complete-by-Date for each corrective action listed that complies with:

   a. Section 641-3.01 (4), and

   b. The CGP.

   Provide a copy of the completed, unsigned Inspection Report to the Engineer by the end of the next business day following the inspection.

   The Superintendent must review, correct errors, and sign and certify the Inspection Report, within 3 days of the date of Inspection. The Engineer may coordinate with the Superintendent to review and correct any errors or omissions before the Superintendent signs the report. Corrections are limited to adding missing information or correcting entries to match field notes and conditions present at the time the Inspection was performed. Deliver the signed and certified Inspection Report to the Engineer on the same day the Superintendent signs it.

   The Engineer will sign and certify the Inspection Report and will return the original to the Contractor within three working days.

The Engineer may make corrections after the Superintendent has signed and certified the Inspection Report. The Engineer will initial and date each correction. If the Engineer makes corrections, the Superintendent must recertify the Inspection Report by entering a new signature and date in the white space below the original signature and date lines. Send a copy of the recertified Inspection Report to the Engineer on the day it is recertified.

If subsequent corrections to the certified Inspection Report are needed, document the corrections in an amendment memo that addresses only the omitted or erroneous portions of the original Inspection Report. The Superintendent and the Engineer must both sign and certify the amendment memo. The issuance of an amendment memo does not relieve the Contractor of liquidated damages that may have been incurred as a result of the error on the original certified inspection report.

3. Inspection before Seasonal Suspension of Work.

Conduct an Inspection before seasonal suspension of work to confirm BMPs are installed and functioning according to the requirements of the SWPPP and CGP.

4. Reduced Inspection Frequencies.

Conduct Inspections according to the inspection schedule indicated in the approved SWPPP. Any change in inspection frequency must be approved by the Engineer, and beginning and ending dates documented as an amendment to the SWPPP.

If the Engineer approves and the entire site is stabilized, the frequency of inspections may be reduced to at least one inspection every 30 days. At actively staffed sites, inspect within 2 business days of the end of a storm event that results in a discharge from the site.

When work is suspended due to fall freeze-up, the Engineer may suspend inspection requirements after fourteen days of freezing conditions if:

a. Soil disturbing activities are suspended; and

b. Soil stabilizing activities are suspended.

Inspections must resume according to the normal inspection schedule identified in the SWPPP, at least 21 days before anticipated spring thaw. See CGP Part 6.2.3.

The Engineer may waive requirements for updating the Grading and Stabilization Activities Log and Daily Record of Rainfall during seasonal suspension of work. If so, resume collecting and recording weather data on the Daily Record of Rainfall form one month before thawing conditions are expected to result in runoff. Resume recording land disturbance and stabilization activities on the Grading and Stabilization Activities Log when Construction Activity resumes.

5. Stabilization before Fall Freeze-up and Spring Thaw.

Stabilize Construction Activities within the Project Zone with appropriate BMPs prior to the anticipated date of fall freeze-up, in accordance with the CGP Part 4.12.

Exceptions to stabilization prior to anticipated date of fall freeze up include:

a. When stabilization activities are precluded by snow cover or frozen ground conditions prior to the anticipated date of fall freeze up, or

b. When winter construction activity is authorized by the Engineer and conducted according to the contract.

Stabilize Construction Activities within the Project Zone with appropriate BMPs prior to spring thaw, as defined in the CGP.

6. Inspection before Project Completion.

   Conduct Inspection to ensure Final Stabilization is complete throughout the Project, and temporary BMPs that are required to be removed are removed. Temporary BMPs that are biodegradable and are specifically designed and installed with the intent of remaining in place until they degrade, may remain in place after project completion.

7. Items and Areas to Inspect.

   Conduct Inspections of the areas required by the CGP and SWPPP.

8. SWPPP Amendments and SWPPP Amendment Log.

   The Superintendent and the SWPPP Manager are the only persons authorized to amend the SWPPP and update the SWPPP Amendment Log Form 25D-114. The Superintendent or the SWPPP Manager must sign and date amendments to the SWPPP and updates to the SWPPP Amendment Log.

   SWPPP Amendments must be approved by the Engineer.

   Amendments must occur:

   a. Whenever there is a change in design, construction operation, or maintenance at the construction site that has or could cause erosion, sedimentation or the discharge of pollutants that has not been previously addressed in the SWPPP;

   b. If an Inspection identifies that any portion of the SWPPP is ineffective in preventing erosion, sedimentation, or the discharge of pollutants;

   c. Whenever an Inspection identifies a problem that requires additional or modified BMPs

   d. Whenever a BMP is modified during construction or a BMP not shown in the original SWPPP is added;

   e. If the Inspection frequency is modified (note beginning and ending dates); or

   f. When there is a change in personnel who are named in the SWPPP, according to Subsection 641-2.01.4.

   Amend the SWPPP narrative as soon as practicable after any change or modification, but in no case, later than 7 days following identification of the need for an amendment. Every SWPPP Amendment must be signed and dated. Cross-reference the amendment number with the Corrective Action Log or SWPPP page number, as applicable. When a BMP is modified or added, describe the BMP according to Subsection 641-2.01.3.

   Keep the SWPPP Amendment Log current. Prior to performing each scheduled Inspection, submit to the Engineer a copy of the pages of the Amendment Log that contain new entries since the last submittal. Include copies of any documents amending the SWPPP.

   Keep the SWPPP Amendment Log as an appendix to the SWPPP.

9. Site Maps.

   Document installation, routine maintenance, and removal of BMPs by making notes on the SWPPP Site Maps. Include the date and the recording person's initials by these notes. Identify areas where Construction Activities begin, areas where Construction Activities temporarily or permanently cease, and areas that are temporarily or permanently stabilized.

10. Corrective Action Log.

    The Superintendent and SWPPP Manager are the only persons authorized to make entries on the SWPPP Corrective Action Log, Form 25D-112. Document the need for corrective action within 24 hours of either:

    a. Identification during an inspection; or

    b. Discovery by the Department's or Contractor's staff, a subcontractor, or a regulatory agency inspector.

    Modification or replacement of a BMP, installation of a new BMP not shown in the original SWPPP, overdue BMP maintenance, or other reasons listed as corrective actions in 641-3.01.4 must be documented on the Corrective Action Log.

    Within 24 hours of discovery, update the Corrective Action Log Form 25D-112, with the date of discovery and proposed corrective action. If discovered during an inspection, update log with inspection date and proposed corrective actions noted on the Inspection Report. If discovered outside of an inspection, update the log with the date of discovery, the proposed corrective action, and the date the corrective action was completed.

    After the corrective action has been accomplished, note in the Corrective Action Log the action taken and if a SWPPP amendment was needed. Date and initial the entry.

    Keep the Corrective Action Log current and submit a copy to the Engineer prior to performing each scheduled SWPPP Inspection.

    Keep the Corrective Action Log as an appendix to the SWPPP.

11. Grading and Stabilization Activities Log.

    The Superintendent and SWPPP Manager are the only persons authorized to date and initial entries on the SWPPP Grading and Stabilization Activities Log, Form 25D-110. Use the SWPPP Grading and Stabilization Activities Log, to record land disturbance and stabilization activities.

    Keep the Grading and Stabilization Activities Log current and submit a copy to the Engineer prior to performing each scheduled SWPPP Inspection. Keep the Grading and Stabilization Activities Log organized and completed to demonstrate compliance with the CGP Part 4.5.

    Keep the Grading and Stabilization Activities Log as an appendix to the SWPPP.

12. Daily Record of Rainfall.

    Use SWPPP Daily Record of Rainfall, Form 25D-115, to record weather conditions at the Project. Update the form daily and include the initials of the person recording each day's entry. Submit a copy to the Engineer prior to performing each scheduled Inspection. Keep the Daily Record of Rainfall as an appendix to the SWPPP.

13. Staff Tracking Log.

    Use the SWPPP Project Staff Tracking, Form 25D-127, to keep staff records current. Include Records of the AK-CESCL or equivalent qualifications for the Superintendent, SWPPP Manager, ATS operator, any acting Superintendent and acting SWPPP Managers, and beginning and end dates for temporary personnel assignments related to administration of the CGP or Section 641. Update the SWPPP Staff Tracking Log within 24 hours of any changes in personnel, qualifications, or other staffing items related to administration of the CGP or Section 641.

641-3.04 FAILURE TO PERFORM WORK. The Engineer has authority to suspend work and withhold monies, for an incident of non-compliance with the CGP, or SWPPP, that may endanger health or the environment or for failure to perform work related to Section 641.

1. **Non-compliance.**

   a. **Incidents of Non-compliance.** Failure to:

      (1) Obtain appropriate permits before Construction Activities occur;

      (2) Perform SWPPP Administration;

      (3) Perform timely Inspections;

      (4) Update the SWPPP;

      (5) Transmit updated SWPPP, Inspection Reports, and other updated SWPPP forms to the Engineer;

      (6) Maintain effective BMPs to control erosion, sedimentation, and pollution in accordance with the SWPPP, the CGP, and applicable local, state, and federal requirements;

      (7) Perform duties according to the requirements of Section 641; or

      (8) Meet requirements of the CGP, SWPPP, or other permits, laws, and regulations related to erosion, sediment, or pollution control.

   b. **Notice of non-compliance**, either oral or written will include:

      (1) Reason/defects

      (2) Corrective actions required

      (3) Time allowed for completing the corrective action

   c. **Levels of Non-compliance and Response** correspond with harm to the workers, the public or the environment and whether the harm is:

      (1) **Not-imminent**, the Engineer will either orally or in writing, or both, provide notice to the Contractor indicating the incident of non-compliance.

      Contractor's that take corrective action and complete the action to the satisfaction of the Engineer, within the time specified, may return to the status of compliance, and avoid elevating the response to imminent.
      .

      (2) **Imminent**, the Engineer will orally provide notice to the Contractor of non-compliance and promptly provide written notice to suspend work until corrective action is completed.

      Additional actions, taken against the Contract whether the level of non-compliance is Not-imminent or Imminent, may include:

      (1) Withholding monies until corrective action is completed

      (2) Assessing damages or equitable adjustments

      (3) Employing others to perform the corrective action and deduct the cost

No additional Contract time or additional compensation will be allowed due to delays caused by the Engineer’s suspension of work.

641-3.05 ACCESS TO WORK.

The Project, including any related off-site areas or support activities, must be made available for inspection, or sampling and monitoring, by the Department and other regulatory agencies. See CGP Part 6.6.

641-4.01 METHOD OF MEASUREMENT.

See Section 109 and as follows:

Item 641.0001.____, and 641.0007.____, are lump sum.

Item 641.0005.____, measured on a contingent sum basis as specified by the Directive authorizing the work.

Item 641.0006.____, measured on a contingent sum basis with withholding determined by the Department.

TABLE 641-1 BMP VALUES - RESERVED

Liquidated Damages assessed according to Table 641-2 are not an adjustment to the Contract amount. These damages charges are related to Contract performance but are billed by the Department to the Contractor, independent of the Contract amount. An amount equal to the Liquidated Damages may be withheld for unsatisfactory performance, from payment due under the Contract, until the Contractor remits payment for billed Liquidated Damages.

TABLE 641-2- VERSION C
EROSION, SEDIMENT AND POLLUTION CONTROL – LIQUIDATED DAMAGES

Code	Specification Section Number and Description	Deductible Amount in Dollars	Cumulative Deductible Amounts in Dollars
A	641-1.04 Failure to have a qualified (AK-CESCL or equivalent) SWPPP Manager	Calculated in Code B or F	
B	Failure to meet SWPPP requirements of: (1) 641-2.01.1 Name of SWPPP Preparer (2) Not Applicable (3) 641-3.03.8 Sign and Date SWPPP amendments by qualified person. (4) 641-3.02 Records maintained at project and made available for review	$750 per omission	
C	Not Applicable.		
D	641-3.03.5 Failure to stabilize a Project prior to fall freeze-up.	$5,000 per Project per year	
E	641-2.01.1. Failure to conduct pre-construction inspections before Construction Activities on all projects greater than 1 acre.	$2,000 per Project	
F*	641-3.03. Failure to conduct and record CGP Inspections 641-3.03.1 Personnel conducting Inspections and Frequency 641-3.03.2 Inspection Reports, use Form 25D-100, completed with all required information	$750 per Inspection	Additional $750 for every additional 7 day period without completing the required inspection.
G	641-3.01.4 Corrective action, failure to timely accomplish BMP maintenance and/or repairs. In effect until BMP maintenance and/or repairs is completed.	$500 per Project per day	
H	641-3.01.3 Failure to provide to the Engineer and DEC a timely oral noncompliance report of violations or for a deficient oral noncompliance report	$750 for the first day the report is late or deficient	Additional $750 for every 14 day period without the required information
I	641-3.01.3 Failure to provide to the Engineer and DEC a timely written noncompliance report, use Form 25D-143, of violations or for a deficient written noncompliance report	$750 for the first day the report is late or deficient	Additional $750 for every 14 day period without the required information
J	641-3.04 Failure to comply with the requirements of the CGP, approved SWPPP, and Section 641, except as listed above	$750 per occurrence for the first day of noncompliance	Additional $750 for every day the deficiency remains uncorrected

***CODE F**. Liquidated Damages according to Code F will not be billed for typographic errors and minor data entry errors, except the liquidated damages will be assessed for these errors when:

a. the Contractor has previously been notified and subsequent inspection reports repeat the same or similar error,
b. multiple inspection reports are submitted after the submission due date and the same or similar errors are repeated on multiple overdue reports,
c. an error in recording the inspector's AK-CESCL certification date results in an inspector performing the inspection during a period when their certification was lapsed or was otherwise invalid

641-5.01 BASIS OF PAYMENT. See Subsection 641-3.04 Failure to Perform Work, for additional work and payment requirements.

Item 641.0001.____ Erosion, Sediment and Pollution Control Administration. At the Contract lump sum price for administration of all work under this Section. Includes, but is not limited to, SWPPP and HMCP and SPCC Plan preparation, agency fees for SWPPP reviews, SWPPP amendments, pre-construction Inspections, Inspections, monitoring, reporting, and Record keeping or copying Records related to the SWPPP and required by the CGP, and Record retention.

Item 641.0005.____ Temporary Erosion, Sediment and Pollution Control by Directive. At the contingent sum prices specified in the Directive using time and materials to authorize the work, for all labor, supervision, materials, equipment, and incidentals to install, maintain, remove and dispose of temporary erosion, sedimentation, and pollution control BMPs. Prices for this item will be by time and materials according to Subsection 109-1.05, or by mutual agreement between the Engineer and Contractor. All additional Erosion, Sediment, and Pollution Control Administration necessary due to this item will not be paid for separately but will be subsidiary to other bid items.

Item 641.0006.____ Withholding. The Engineer may withhold an amount equal to Liquidated Damages, assessed according to Section 641, from payment due the Contractor. Liquidated Damages for violations of the Contract, CWA, and CGP are determined by the Engineer according to Table 641-2. The Engineer may withhold payment due the Contractors until the Contractor pays the Liquidated Damages to the Department.

The Department will not release performance bonds until Liquidated Damages assessed according to Section 641 are paid to the Department, and all requirements according to Subsection 103-1.05 are satisfied.

Item 641.0007.____ SWPPP Manager. At the Contract lump sum price for a SWPPP Manager that conforms to this specification. When Item 641.0007.____ appears in the Bid Schedule, the SWPPP Manager must be a different person than the superintendent, and must be physically present during construction activity with duties and authority as described in Subsection 641-2.04. When Item 641.0007.____ does not appear in the Bid Schedule, the SWPPP Manager is subsidiary to Item 641.0001.____.

Subsidiary Items. Temporary erosion, sediment, and pollution control measures that are required outside the Project Zone are subsidiary. Work required by the HMCP and SPCC Plan including hazardous material storage, containment, removal, cleanup and disposal, are subsidiary to Item 641.0001.____ Erosion, Sediment and Pollution Control Administration.

Work under other pay items. Work that is paid for directly or indirectly under other pay items will not be measured and paid for under Section 641. This work includes but is not limited to:

1. Dewatering;
2. Shoring;
3. Bailing;
4. Permanent seeding;
5. Installation and removal of temporary work pads;
6. Temporary accesses;
7. Temporary drainage pipes and structures;
8. Diversion channels;
9. Settling impoundment; and
10. Filtration.

Permanent erosion, sediment, and pollution control measures will be measured and paid for under other Contract items, when shown on the bid schedule.

Work at the Contractor's Expense. Temporary erosion, sediment, and pollution control measures that are required due to carelessness, negligence, or failure to install temporary or permanent controls as scheduled or ordered by the Engineer, or for the Contractor's convenience, are at the Contractor's expense.
Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
641.0001.____	Erosion, Sediment and Pollution Control Administration	LS
641.0005.____	Temporary Erosion, Sediment and Pollution Control by Directive	CS
641.0006.____	Withholding	CS
641.0007.____	SWPPP Manager	LS

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SECTION 642
CONSTRUCTION SURVEYING AND MONUMENTS

Special Provisions

642-2.01 MATERIALS. Add No. 4:

4. Digital Measuring Instrument: Nu-metrics, Nitestar DMI (www.ae-traffic.com), or approved equal.

642-3.01 GENERAL. Add No. 11:

11. Before work on the project starts, stake and reference the existing centerline on both sides of the roadway alignment. Stake the existing centerline on tangents at 100 ft, and 50 ft intervals on curves from the beginning and ending of super-elevation changes when the roadway is no longer at normal crown. Stake sign locations at proper offset. Stakes shall be a minimum of 1" x 2" x 2'-0" and be offset 4 to 8 ft from the shoulder on both sides of the roadway. Extend lath stakes a minimum of 2 ft above ground. Show the offset distance to centerline and the station from the beginning of the project. Maintain staking until the final roadway striping is completed. Staking accuracy work requires an electronic distance measuring instrument (DMI) be installed in the Contractor's vehicle. Calibrate the DMI to roadway alignments as stationed in the Plans before beginning work. Record the calibration and staking information in the field book.

    Install a reference sign every 500 ft. These reference signs shall meet the following requirements:

    1. mounted with the base a minimum of 5 ft above the shoulder,
    2. located a minimum of 10 ft from the edge of shoulder,
    3. marked with the station from the beginning of the project, in 6 inch high permanent black lettering with a letter proportion height to width ration of 1:0.6 and a stroke width to height ratio of 1:6, on an orange background.

CR642.1-022015R

Add No. 12:

12. Passing Sight Distance. Record the existing centerline striping and final passing sight distance. A copy of the 8 1/2" x 11" Existing Striping, Passing Sight Distance and Final Striping form is included herein. Document the existing passing and sight distance similar to the example included.

    Using the "Existing Striping, Passing Sight Distance and Final Striping" form:

    a. Document the existing striping. Do not disturb the existing striping until the striping record is accepted by the Engineer.

        1) Project Information: Road Name, Stationing, Surveyor & license, Date surveyed.
        2) Col. 1.: Project Stationing in 100-foot intervals from beginning to end of project.
        3) Col. 2.: Posted operating speed per minimum passing sight distance (Table 642-1).
        4) Col. 3a & 4a: Each direction of travel (NB; SB, EB, WB) record the existing striping: passing (dashes) and no passing zones (continuous line) similar to the example. Maintain the orientation of travel to the form, each road, from the beginning of the project to the end of the project.
        5) Col. 6.: Add comments to help clarify the documentation and significant sight obstructions, as needed. Initial your comments.

        Submit the form to the Engineer and make changes when directed by the Engineer.

    b. Document the passing sight distance. Use the form approved in a. for b. Measure and record, after the base course layer is complete, passing sight distance along the roadway in both directions of traveled way at 100-foot maximum intervals and referenced to the project station. Use a 3.5-foot object height or instrument height looking ahead to a 3.5-foot target height which is at the centerline or opposing edge of traveled way.

1) Col. 3 & 4.: Each direction of travel (NB, SB, EB, WB) record the sight distance each station. Record the measurement to the nearest 100-foot up to 1200-foot where the passing sight distance exceeds the minimum passing sight distance. Where the passing sight distance exceeds 1200-foot, record the measurement as "1200+ Feet." Record the measurement to the nearest 10-foot at all stations that fall below the minimum passing sight distance.
2) Col. 6.: Add comments to help clarify the documentation as needed. Initial your comments.

Submit the form to the Engineer and make changes when directed by the Engineer.

c. Final Striping. Using the information approved in a. and b., the existing striping and passing sight distance, the Engineer will evaluate the existing striping and provide the final striping plan 14 days after the Contractor's passing sight distance submittal, 12b above.

1) Col. 3 & 4: Engineer, indicate if the existing striping passes (P) or fails (F).
2) Col. 5a & 5b: Engineer, indicate the final striping.
3) Col. 6.: Engineer, add comments if needed to clarify the final striping. Initial your comments.

Do not begin striping until the Engineer returns the form, signed and dated with the final striping plan.

Engineer, provide the Regional Traffic and Safety Engineer an informational copy of the final striping plan.

TABLE 642-1
PASSING SIGHT DISTANCE REQUIREMENTS [a]

Posted Speed (mph)	Minimum Passing Sight Distance and Minimum Length of Passing Zone (ft)	Minimum No-Passing Zone on Stopped Approaches to Intersections (ft)
30	500	220
35	550	255
40	600	295
45	700	330
50	800	365
55	900	405
60	1000	440
65	1100	480
70	1200	515

a. One- and two-direction no-passing zones for one direction of traffic shall be no shorter than 500 feet

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Add the following:

642-3.06 CONTRACTOR FURNISHED ENGINEERING TOOLS. Furnish and maintain Engineering Tools as directed by the Engineer, for the exclusive use of the Engineer throughout the duration of the project. The Contractor shall furnish all equipment specifications to the Engineer for approval, prior to furnishing equipment. The equipment shall be in good working condition not more than 1 model year old. The Contractor shall insure and indemnify the Department against normal wear and tear, damage, theft, and all other events that may cause a loss of function of the furnished tools. The equipment shall be returned to the Contractor upon completion of the project, or when services are terminated by the Engineer. Furnish training for the Engineer's staff, as directed by the Engineer.

1. GPS Rover Unit – All components shall be fully compatible to provide a stand-alone GPS Rover Unit. The Rover Unit shall be an "all on the pole" system equipped with the following:

a. Receiver
   (1) Bluetooth compatible.
   (2) Meet waterproof specification IPX7.
   (3) Shockproof for a drop onto a hard surface from a height of 4 feet.
   (4) Dual frequency receiver capable of tracking at least twelve (12) satellites simultaneously on parallel channels.
   (5) Capable of RTK, Static, and Fast Static occupations.
   (6) Capable of receiving L1, L2, and GNSS frequencies.
   (7) Antenna model shall have undergone antenna calibration by the NGS.
   (8) Ensure the receiver contains the manufacturer's latest firmware upgrades.
   (9) Provide the manufacturer's user guide.

b. Controller
   (1) Bluetooth compatible.
   (2) Equipped with onboard software allowing for the configuration of RTK, PPK, or Static rover modes.
   (3) Meet waterproof specification IPX7.
   (4) Shockproof for a drop onto a hard surface from a height of 4 feet.
   (5) Full QWERTY keyboard with numeric keypad, and/or equivalent touch screen interface.
   (6) Capable of collecting data in WGS84 and displaying local project coordinates.
   (7) Equipped with onboard software that allows automatic point logging.
   (8) Capable of creating and storing line-work in DFX or DWG format.
   (9) Equipped with onboard software to allow the user to stake-out points, 3D lines, and DTM surfaces. Software shall allow the user to read cut/fill elevations relative to a DTM surface.
   (10) Capable of importing, exporting, and storing point, line, and DTM data.
   (11) Capable of showing satellite, radio, and battery status.
   (12) Equipped with onboard software that allow the user to create and manage survey jobs, point data, coordinate systems, and alignments.
   (13) Equipped with a removable memory storage device with a minimum capacity of 512MB.
   (14) Capable of storing custom configuration settings for the GPS Rover Unit.
   (15) Ensure the controller contains the manufacturer's latest firmware upgrades.
   (16) Provide the manufacturer's user guide.

c. Radio System
   (1) Meet waterproof specification IPX7.
   (2) Support a frequency compatible with the Reference Station.
   (3) Capable of storing multiple radio frequencies.
   (4) Compatible with the Reference Station's broadcasting format and protocol.
   (5) Power and programming cables.
   (6) Provide the manufacturer's user guide.

d. Batteries
   (1) Provide all batteries required to fully power and operate the GPS Rover Unit.
   (2) Batteries shall be capable of powering their respective equipment continuously, for not less than 6 hours under normal operating conditions.
   (3) Each battery shall be rechargeable and commercially available.
   (4) Provide an identical replacement backup battery for each primary battery required.
   (5) Provide all power connectors necessary to connect the batteries to the equipment.
   (6) Provide battery chargers to allow all onboard batteries to be charged simultaneously, and that safeguard against overcharging.

e. Rod
   (1) Fixed height (non-adjustable).
   (2) Mounting hardware for GPS controller and radio.
   (3) Pole grip with bubble level.
   (4) Detachable bipod.
   (5) Interchangeable flat and pointed footings.
   (6) Quick release adapter for the GPS receiver.

f. Carrying Case
   (1) Hard Shell.
   (2) Shockproof.
   (3) Waterproof.
   (4) Capacity to hold all components of the GPS rover, minus the rod.

2. Continually Operating Reference Station – The location of the CORS shall not change for the duration of the project. The CORS shall be permanently mounted per NGS CORS standards. All structures, mounting hardware, power supply, computers, software, networking, and personnel required to support and operate the CORS is considered subsidiary to this item. Store CORS data for the duration of the project, and post online for use by the Engineer. The CORS shall include and conform to the following requirements:
   a. GPS Receiver
      (1) Choke-ring antenna, model shall have undergone antenna calibration by the NGS.
      (2) Meet waterproof specification IPX7.
      (3) Shockproof for a drop onto a hard surface from a height of 4 feet.
      (4) Able to operate in temperatures between -20º F to +140º F.
      (5) Capable of logging L1/L2 data continuously for 180 days, and storing at 1 second intervals. If onboard memory storage capacity is insufficient, backup all data on an external memory storage device.
      (6) Support multiple, simultaneous data logging sessions at different collection rates.
      (7) Equipped with a dual frequency receiver capable of tracking L1, L2, and GNSS frequencies on at least 12 satellites. Receiver shall have a minimum of 24 channels.
      (8) Support CMR/CMR+ and RTCM output simultaneously via separate ports.
      (9) Use multi-path mitigation techniques.
      (10) Satellite acquisition technology shall provide improved tracking in areas of high radio interference such as under power lines, around airports, near radio-intensive construction sites.
      (11) Capable of 1PPS output with an accuracy of 1*u*sec.
      (12) Equipped with 1 primary and 1 secondary power input port.
      (13) The system shall automatically switch between power sources.
      (14) Equipped with over-voltage protection on all power inputs.
      (15) Capable of reporting Signal-to-Noise Ratio (SNR) values for L1 and L2.
      (16) Capable of logging data at operator selected intervals of 0.5, 1, 5, and 30 seconds.
      (17) Provide the manufacturer's user guide.

   b. Radio
      (1) Transmission power, 25 watt minimum.
      (2) Meet waterproof specification IPX7.
      (3) Ensure the radio has a current license to broadcast in accordance with FCC requirements.
      (4) Ensure the radio broadcast frequency doesn't conflict with other nearby broadcasting sources.
      (5) Provide the manufacturer's user guide.

   c. CORS Facility – Provide a facility to mount and house CORS station equipment.
      (1) Facility shall meet NGS CORS mounting requirements, and shall be approved by the Engineer.
      (2) Shall be physically located in a clear view of the sky, away from objects that may cause multi-path interference.
      (3) Location shall provide for maximum strength of geometry relative to the primary control network and the project limits.
      (4) Shall be connected to a primary power source, and a backup power source capable of providing uninterrupted backup power for a minimum of 48 hours.

3. GPS Base/Repeater Station – All components shall be fully compatible to provide a stand-alone GPS Base/Repeater Station setup. The setup shall include the following:
   a. Receiver
      (1) Meet waterproof specification IPX7.
      (2) Shockproof for a drop onto a hard surface from a height of 4 feet.
      (3) Dual frequency receiver capable of tracking at least 12 satellites simultaneously on parallel channels.
      (4) Antenna model shall have undergone antenna calibration by the NGS.
      (5) Ensure the receiver contains the manufacturer's latest firmware upgrades.
      (6) Carrying case.
      (7) Tribrach with optical plummet and height rod.
      (8) Provide the manufacturer's user guide.

   b. Controller
      (1) Equipped with onboard software allowing for configuration as a GPS reference station in RTK, PPK, Static, and Fast Static modes.
      (2) Capable of logging raw observations for post processing.
      (3) Capable of showing satellite, radio, and battery status.
      (4) Meet waterproof specification IPX7.
      (5) Shockproof for a drop onto a hard surface from a height of 4 feet.
      (6) Full QWERTY keyboard with numeric keypad, and/or equivalent touch screen interface.
      (7) Equipped with a removable memory storage device with a minimum capacity of 512MB.
      (8) Equipped with 1 primary and 1 secondary power input port.
      (9) Ensure the controller contains the manufacturer's latest firmware upgrades.
      (10) Provide the manufacturer's user guide.

   c. Radio
      (1) Transmission power, 25 watt minimum.
      (2) Meet waterproof specification IPX7.
      (3) Shockproof for a drop onto a hard surface from a height of 4 feet.
      (4) Support a frequency compatible with the Reference Station.
      (5) Capable of storing multiple radio frequencies.
      (6) Compatible with the CORS broadcasting format and protocol.
      (7) Ensure the radio has a current license to broadcast in accordance with FCC requirements.
      (8) Ensure the radio broadcast frequency doesn't conflict with other nearby broadcasting sources.
      (9) Equipped with onboard software/firmware allowing for configuration as either a Reference Station or a Repeater Station.
      (10) Carrying case.
      (11) Antenna.
      (12) Antenna/pole mounting adapter.
      (13) Provide the manufacturer's user guide.

   d. Tripods – Provide one of each:
      (1) Conventional tripod with extendible range pole. Include carrying case.
      (2) Conventional wood tripod.

   e. Batteries
      (1) Provide all batteries required to fully power and operate the GPS Base/Repeater Station.
      (2) Batteries shall be capable powering their respective equipment continuously, for not less than 6 hours under normal operating conditions.
      (3) Each battery shall be rechargeable and commercially available.
      (4) Provide an identical replacement backup battery for each primary battery required.
      (5) Provide all power connectors necessary to connect the batteries to the equipment.
      (6) Provide battery chargers to allow all batteries to be properly charged, and that safeguard against overcharging.

4. Computer Hardware – Hardware shall meet the following minimum requirements:
   a. Laptop Computer
      (1) 2.8 GHz multi-core CPU.
      (2) 120GB Internal Hard Drive.
      (3) 4 GB System RAM.
      (4) Display 13” with 1,600 x 1,200 resolution.
      (5) 512MB video memory.
      (6) DVD Burner Drive.
      (7) Internal Bluetooth and Wi-fi.
      (8) Internal Battery.
      (9) 120v AC Adapter.
      (10) 12v DC Adapter.
      (11) Built-in CF, SD, and PCMCIA card ports.
      (12) 4 USB 2.0 ports.
      (13) 1394 (firewire) port.
      (14) Mouse (wireless).
      (15) Travel Case (hard) for laptop and accessories.

   b. Laptop Computer Mount
      (1) Permanently installed in a vehicle, as directed by the Engineer.
      (2) Fastened to the passenger side of the vehicle.
      (3) Shock and vibration resistant.
      (4) Fully adjustable positioning with mechanically locking hinge points.

   c. Desktop Computer
      (1) 3 GHz multi-core CPU
      (2) 120GB Internal Hard Drive
      (3) 4 GB System RAM
      (4) Compatible DVI 19” monitor with 1,600 x 1,200 resolution
      (5) Internal video card/chip, 512MB, 2 DVI ports
      (6) Internal DVD Burner Drive
      (7) CF and SD media card reader
      (8) 6 USB ports
      (9) 1394 (firewire) port
      (10) Internal wireless (IEEE 802.11 b/g) network card
      (11) Internal Ethernet card (10/100 Mbps).
      (12) Uninterruptible Power Source (UPS), 8 outlets, 390 Watt
      (13) 250 GB Backup Hard Drive (external)
      (14) Mouse and Keyboard

   d. Laser Printer
      (1) 45 pages per minute print speed.
      (2) 1200 x 1200 dpi print quality.
      (3) Main tray capacity shall hold no less than 500, 8.5 x 11 inch sheets.
      (4) Multipurpose tray capable of custom sizes up to 11 x 17 inch sheets.
      (5) 128 MB of onboard memory, minimum.

5. Computer Software – All software shall be licensed and fully operational. Provide software that is similar or approved equal in accordance with the following:
   a. Operating System Software – Provide an operating system that supports the drivers of all onboard and auxiliary computer hardware systems. The operating system shall be of the latest release, with the most current updates installed. The operating system shall support all of the applications listed below.

   b. CAD Software – Provide CAD software that is capable of dynamically associating and updating alignment, profile, section, grading, point, and surface data. The software shall be capable of saving all data to formats that are compatible with the latest release of CAD software currently used by the Department. Formatting shall preserve the dynamic relationship of all DTM features. Software that doesn’t dynamically associate all DTM features is not acceptable.

c. Word Processing Software – Provide software that is compatible with the latest release of word processing software currently used by the Department.

d. Spreadsheet Processing Software – Provide software that is compatible with the latest release of spreadsheet processing software currently used by the Department.

e. Anti-Virus Software – Provide software to protect against viruses and other security threats. Software shall be equipped with a firewall containing industry standards of system protection. The software shall be capable of backing up all hard drive data.

f. GPS Processing Software – Provide GPS processing software of the latest release and from the same vendor as the GPS equipment furnished. Include all necessary hardware/software keys to enable L1 & L2 Static, PPK, and RTK processing, GNSS processing, network adjustments, datum and map transformations, and RINEX data importing and exporting.

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642-4.01 METHOD OF MEASUREMENT. Add the following:

Pay Item 642.0008.____ Passing Sight Distance Measurement. By the number of stations of the project measured separately along centerline, once for each direction, only after the certified and recorded results (642-3.01 12a & 12b) have been accepted by the Engineer.

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Add the following:

Pay Item 642.0014.____ Contractor Furnished Engineering Tools. Contingent sum work will be measured in accordance with the directive authorizing the work.

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642-5.01 BASIS OF PAYMENT. Add the following Pay Item:

PAY ITEM

Item Number	Item Description	Unit
642.0008.____	Passing Sight Distance Measurement	STA

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Add the following:

Pay Item 642.0014.____ Contractor Furnished Engineering Tools. The Engineer shall issue a directive defining and authorizing the work. Payment for a GPS Rover, Base/Repeater Station, CORS, or Computer System will be made on a time and materials basis in accordance with Subsection 109-1.05-3e, Leased or Rented Equipment. Payment for training will be made on a time and materials basis in accordance with Section 109-1.05. If the training is beyond the Contractor's ability or expertise, payment will be made in accordance with Subsection 109-1.05-4, Work by a Specialty Subcontractor. The Engineer may withhold payment for this item if the minimum specifications are not met. The Engineer may issue a directive at any time to terminate or re-authorize the work, at no additional cost to the Department.

Add the following Pay Item:

PAY ITEM

Item Number	Item Description	Unit
642.0014.____	Contractor Furnished Engineering Tools	Contingent Sum

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Existing Striping, Passing Sight Distance and Final Striping

Project Name and Number: *Example Project Striping, X-(XX)/XXXXX*
Road Name: *Traveled Way*
Stationing: From *101+00* To *129+00*
Surveyor & License Number: *Name, License #* Date of Survey: *mmddyy*

1. Station (ft.)	2. Speed/ Req'd Dist. (mph/ft)	SB Travel 3. Sight Dist. (ft)	SB Travel Existing Striping 3a. C L 4a.	NB Travel 4. Sight Dist. (ft)	SB Travel 5. Final Striping 5a. C L	NB Travel 5. Final Striping 5b.	6. Comments
101+00	45/700	>500 F		>500 F			
102+00	45/700	>550 F		>400 F			
103+00	45/700	>600 F		>400 F			
104+00	45/700	>600 F		>400 F			
105+00		>600 F		>400 F			
106+00		>500 F		>500 F			
107+00		>400 F		>500 F			
108+00		>400 F		>600 F			
109+00		>400 F		>550 F			
110+00		>500 F		>500 F			
111+00	45/ 700	>500 F		=700 P			
112+00		=700 P		=700 P			
113+00		=700 P		<800 P			
114+00		<800 P		<800 P			
115+00		<800 P		<800 P			
116+00		<800 P		<900 P			
117+00		<900 P		<900 P			
118+00		<1200 P		<1000 P			
119+00		<1200+ P		<1000 P			
120+00	45/700	"		<1000 P			
121+00	30/500	"		<1000 P			
122+00	30/500	"		<1200 P			
123+00	30/500	"		<1200+ P			
124+00	30/500	"		"			
125+00	30/500	"		"			
126+00	30/500	"		"			
127+00	30/500	"		"			
128+00	60/900	"		"			
129+00	60/900	<1200+ P		<1200+ P			

Existing Striping, Passing Sight Distance and Final Striping

Project Name and Number: ______________________________

Road Name: ______________________________

Stationing: From ______________________ To ______________________

Surveyor & License Number: ______________________ Date of Survey: __________

1. Station (ft.)	2. Speed/ Req'd Dist. (mph/ft)	__ Travel	__ Travel		__ Travel		__ Travel		6. Comments
		3. Sight Dist.	Existing Striping		4. Sight Dist.	5. Final Striping			
			3a. ↓ C	L 4a. ↑		5a. ↓ C	L 5b. ↑		

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Existing Striping 12a. – Date Received: _____

_____ Date Returned: _____
DOT/PF Engineer

Sight Distance 12b. – Date Received: _____

_____ Date Returned: _____
DOT/PF Engineer

Final Striping 12c. – Date Received: _____

_____ Date Returned: _____
DOT/PF Engineer

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Special Provisions

Replace Section 643 with the following:

SECTION 643
TRAFFIC MAINTENANCE

643-1.01 DESCRIPTION. Protect and control traffic during the contract. Furnish, erect, maintain, replace, clean, move, and remove the traffic control devices required to ensure the traveling public's safety. Perform all administrative responsibilities necessary to implement this work.

Maintain all roadways and pedestrian and bicycle facilities affected by the work in a smooth and traversable condition. Construct and maintain approaches, crossings, intersections, and other necessary features throughout the project for the life of the contract.

Illuminate construction activities listed in Table 643-4 during hours of night work on roads open to the public within project limits.

643-1.02 DEFINITIONS. These definitions apply only to Section 643.

ATM. When used in this Section, ATM stands for the *Alaska Traffic Manual*, which is comprised of the Manual on Uniform Traffic Control Devices (MUTCD), the Alaska Traffic Manual Supplement, any adopted revisions or interim addenda to either document issued subsequently, and corrections to known errors to either document.

BALLOON LIGHT. Light surrounding by a balloon-like enclosure kept inflated by pressurized air or helium, and producing uniform light through 360 horizontal degrees.

CONSTRUCTION PHASING PLAN. A plan for each phase of the project showing how to accommodate traffic. Show the sequence of work by segment or phase, if required.

FIXED OBJECTS. Private vehicles, parked flagger vehicles, idle construction equipment, construction material stockpiles, culvert ends, individual trees, power poles, utility poles and appurtenances, and other items deemed by the Engineer to present a hazard to motorists, pedestrians, or bicyclists traveling through the work zone.

NIGHT WORK. Work occurring between sunset and sunrise on all days except the "No Lighting Required" period shown in the Table 643-1 below:

TABLE 643-1
PROJECT LOCATIONS – NIGHT TIME ILLUMINATION EXCLUSION

Latitude	No Lighting Required		Nearby
(degrees)	Start	End	Cities
South of 61	Lighting Required All Year		Everything South of Hope
61	June 11	July 1	Anchorage, Valdez, Girdwood
62	June 2	July 13	Wasilla, Palmer, Glennallen, Talkeetna
63	May 27	July 17	Cantwell, Paxson, McGrath
64	May 22	July 21	Tok, Delta, Nome
65	May 18	July 25	Fairbanks
66	May 14	July 29	Circle City
67	May 10	August 2	Coldfoot, Kotzebue
68	May 7	August 6	Galbraith Lake
69	May 3	August 9	Happy Valley
70	April 30	August 12	Deadhorse
71	April 27	August 15	Barrow
72	April 24	August 19	

TRAFFIC. The movement of vehicles, pedestrians, and bicyclists through road construction, maintenance operations, utility work, or similar operations.

TRAFFIC CONTROL PLAN (TCP). A drawing or drawings indicating the method or scheme for safely guiding and protecting motorists, pedestrians, bicyclists, and workers in a traffic control zone. The TCP depicts the traffic control devices and their placement and times of use.

TRAFFIC CONTROL ZONE. A portion of a road construction project, maintenance operation, utility work or similar operation that affects traffic and requires traffic control to safely guide and protect motorists, pedestrians, bicyclists, or workers.

643-1.03 TRAFFIC CONTROL PLAN. Implement an approved TCP before beginning work within the project limits.

The TCP includes, but is not limited to, signs, barricades, traffic cones, plastic safety fence, sequential arrow panels, portable changeable message board signs, special signs, warning lights, portable concrete barriers, crash cushions, flaggers, pilot cars, interim pavement markings, temporary lighting, temporary roadways and all other items required to direct traffic through or around the traffic control zone according to these Specifications and the ATM. Address in the TCPs placement of traffic control devices, including location, spacing, size, mounting height and type. Include code designation, size, and legend per the ATM and the Alaska Sign Design Specification (ASDS). Include longitudinal buffer space for the posted speed limit, according to Table 6C-2 of the ATM unless project conditions or geometric features prohibit including all or a portion of the buffer length.

When a TCP is included in the Plans, use it, modify it, or design an alternative TCP. When a TCP is omitted from the Plans, provide one according to this Section and the ATM.

Submit new or modified TCPs to the Engineer for approval. All TCPs must include the following information:

1. Project name and number.
2. A designated TCP number and name on each page.
3. For TCPs more than one page, each page must be numbered.
4. The posted speed limit for each roadway.
5. Existing striping width, lane width, and road surfacing.
6. Construction lane widths, striping layout, and temporary pavement marker layout.
7. Provisions for Pedestrian, Bicycle, and ADA travel through the work zone.
8. Dates and times the TCP will be in effect and why it is being used.
9. The Worksite Traffic Supervisor’s signature certifying that all TCPs conform to the ATM and the Contract.
10. The Project Superintendent’s signature confirming the TCP is compatible with the work plan.
11. The name(s) of the Worksite Traffic Supervisor, his/her alternate and their 24-hour telephone number(s).
12. Signs to be used and the ASDS designation number and size.
13. Location and spacing of all devices and signs.
14. A plan to address any possible slopes, drop offs, paving joints, or similar temporary features that may occur during use of the TCP.

15. For TCPs proposed to be used at night, note how the requirements will be met for the required lighting and retroreflective material.

TCPs submitted for approval without all the required information will be rejected. Allow 7 days for review of each TCP submittal. All required modifications to a TCP require a new submission and an additional 7 days for review.

A minor revision to a previously approved TCP during construction requires 48 hours for review and approval by the Engineer.

The TCPs, Plans, and Alaska Standard Plans show the minimum required number of traffic control devices. If unsafe conditions occur, the Engineer may require additional traffic control devices.

A waiver may be requested, in writing, of regulation 17 AAC 25 regarding oversize and overweight vehicle movements inside the project limits. If the waiver is approved, movements of oversize and overweight vehicles in or near traffic inside the project limits will be done according to the provisions of an approved Traffic Control Plan. Maintain a minimum 12-foot lateral separation between the nonstreet legal vehicles and the motoring public. The Traffic Control Plan shall specify the traffic control devices required for these operations.

Road Closures and Major Traffic Sequencing (events). Submit a written request to the Engineer for review and approval of each proposed event and event date. Allow 7 days for the Engineer to review any proposed event or subsequent changes/corrections. The proposed event date will be no less than 14 days from the date of written approval.

643-1.04 WORKSITE TRAFFIC SUPERVISOR. Provide a Worksite Traffic Supervisor responsible for maintaining 24-hour traffic operations.

1. **Qualifications**. The Worksite Traffic Supervisor shall be knowledgeable and experienced regarding the requirements of the ATM and the implementation of those requirements. The Worksite Traffic Supervisor shall be familiar with the Plans, the Specifications, proposed operations, and certified as one of the following:

   a. Traffic Control Supervisor, American Traffic Safety Services Association (ATSSA)

   b. Work Zone Temporary Traffic Control Technician, or Work Zone Safety Specialist, International Municipal Signal Association (IMSA)

   Certify according to Form 25D-124 that the Worksite Traffic Supervisor has a minimum 4000 hours of temporary traffic control work experience, is competent and capable, and has the authority to perform the duties and responsibilities in accordance with this section.

   - Temporary traffic control work experience shall demonstrate an understanding of concepts, techniques, and practices in the installation and maintenance of traffic control devices, and skill in reading, interpreting, implementing, and modifying TCPs.

   - Temporary traffic control work experience includes: flagging; installing traffic control devices in accordance with TCPs; monitoring traffic control devices and TCP performance; and recognizing and reporting deficiencies in traffic control devices and TCPs for correction.

   - Temporary traffic control work experience is gained while serving as a Worksite Traffic Supervisor-in-training, temporary traffic control support personnel, and Flagger.

   - Four thousand hours of experience serving solely as a Flagger does not satisfy these requirements.

   Worksite Traffic Supervisors shall maintain current certification and be able to show their certification anytime they are on the project.

2. **Duties**.

   a. Prepare the TCPs and public notices and coordinate traffic control operations between the Project Superintendent and the Engineer.

   b. Physically inspect the condition and position of all traffic control devices used on the project at least twice each day and at approximately 12-hour intervals. Ensure that traffic control devices work properly, are clean and visible, and conform to the approved TCP. Complete and sign a detailed written report of each inspection within 24 hours. Use Traffic Control Daily Review Form 25D-104.

   c. Supervise the repair or replacement of damaged or missing traffic control devices.

   d. Review and anticipate traffic control needs. Make available proper traffic control devices necessary for safe and efficient traffic movement.

   e. Review work areas, equipment storage, and traffic-safety material handling and storage.

   f. Hold traffic safety meetings with superintendents, foremen, subcontractors, and others as appropriate before beginning construction, prior to implementing a new TCP, and as directed. Invite the Engineer to these meetings.

   g. Supervise all traffic control workers, flaggers, and pilot car drivers.

   h. Certify that all flaggers are certified as required by Subsection 643-3.04.4. Submit a copy of all flagger certifications to the Engineer.

   i Supervise lighting for night work.

3. **Authority**. The Worksite Traffic Supervisor shall have the Contractor's authority to stop work and implement immediate corrective action to unsafe traffic control, in locations where unsafe traffic control is present.

643-1.05 CONSTRUCTION PHASING PLAN. Submit a Construction Phasing Plan for approval no less than 5 working days prior to the preconstruction conference. Include the following:

1. Form 25D-124 designating the Worksite Traffic Supervisor, providing the 24-hour telephone number, and certifying minimum 4,000 hours of work experience as described in 643-1.04 Worksite Traffic Supervisor.

2. A construction-phasing plan for each phase or segment of the project.

3. TCPs for the first phase of the project. Show permanent and temporary traffic control measures, including the times each TCP will be used.

Submit any changes to the Engineer for approval 7 days before proposed implementation.

643-1.06 TRAFFIC MAINTENANCE SETUP. When shown on the bid schedule, Traffic Maintenance Setup items are site specific and are detailed as individual TCPs on the plan sheets. They depict the method or scheme required to route traffic safely and efficiently when any of the following restrictions occur:

1. **Lane Closure**. The closure of one or more lanes on a roadway.

2. **Detour**. The redirection of traffic through or around a traffic control zone.

3. **Road Closure**. The closure of a roadway with or without a specified detour route.

4. **One Lane Road**. A two-way roadway reduced to a single-lane roadway with flaggers, pilot cars, traffic signals, stop signs, or yield signs.

643-2.01 MATERIALS. Provide traffic control devices meeting the following requirements:

1. **Signs**. Use signs, including sign supports, that conform to Section 615, the ATM, and ASDS.

   a. Construction Signs: Regulatory, guide, or construction warning signs designated in the ASDS.

   b. Permanent Construction Signs: As designated on the Plans or an approved TCP.

   c. Special Construction Signs: All other signs are Special Construction Signs. Neatly mark the size of each sign on its back in 3-inch black numerals.

2. **Portable Sign Supports**. Use wind-resistant sign supports with no external ballasting. Use sign supports that can vertically support a 48 X 48 inch traffic control sign at the height above the adjacent roadway surface required by the ATM.

3. **Barricades and Vertical Panels**. Use barricades and vertical panel supports that conform to the ATM. Use Type III Barricades at least 8 feet long. Use retroreflective sheeting that meets ASTM D4956 Type II or III.

4. **Portable Concrete Barriers**. Use portable concrete barriers that conform to the Contract. For each direction of traffic, equip each 12.5-foot section of barrier with at least two side-mounted retroreflective tabs placed approximately 6 to 8 feet apart, or a continuous 4-inch wide horizontal retroreflective stripe mounted 6 inches below the top of the barrier. Use yellow tabs or stripe when barriers are placed at centerline. Use white tabs or stripe when barriers are placed on the roadway shoulder. Use retroreflective sheeting that meets ASTM D4956 Type III, IV or V.

5. **Warning Lights**. Use Type A (low intensity flashing), Type B (high intensity flashing) or Type C (steady burn) warning lights that conform to the ATM.

6. **Drums**. Use plastic drums that conform to the requirements of the ATM. Use retroreflective sheeting that meets ASTM D4956 Type II or III.

7. **Traffic Cones and Tubular Markers**. Use reflectorized traffic cones and tubular markers that conform to the requirements of the ATM. Use traffic cones and tubular markers at least 28 inches high. Use retroreflective sheeting that meets ASTM D4956 Type II or III.

8. **Interim Pavement Markings**. Apply markings according to Section 670 and the manufacturer's recommendations. Use either:

   a. Paint meeting Subsection 708-2.03 with glass beads meeting Subsection 712-2.08,

   b. Preformed Marking Tape (removable or non-removable) meeting Subsection 712-2.14, or

   c. Temporary Raised Pavement Markers meeting Subsection 712-2.15 or 712-2.16, as appropriate.

9. **High-Level Warning Devices**. Use high-level warning devices that conform to the ATM.

10. **Temporary Crash Cushions**. Use retroreflective sheeting that meets ASTM D4956 Type III, IV or V. Application of crash cushion must be appropriate for the intended use and be installed per manufacturer’s recommendation. Temporary crash cushions used as rail or barrier end treatments must be redirective. Temporary crash cushions that are barrels or barricade filled with sand or water may only be used when the forecasted temperature during their use is above 32 degrees Fahrenheit.

11. **Sequential Arrow Panels**. Use Type A (24 X 48 inch), Type B (30 X 60 inch) or Type C (48 X 96 inch) panels that conform to the ATM.

12. **Portable Changeable Message Board Signs**. Use new truck or trailer mounted portable changeable message board signs with self-contained power supply for the sign and with:

    a. Message sign panel large enough to display 3 lines of 18-inch high characters

    b. Eight character display per message module

c. Fully programmable message module

d. Remote control cellular, wireless radio frequency (RF), landline

e. Waterproof, lockable cover for the controller keyboard

f. Capacity for electric/hydraulic sign raising or lowering

g. Radar over speed detection

h. Variable flash and sequence rates

i. Light emitting diode (LED) display, using Institute of Transportation Engineers (ITE) amber/yellow

j. The capacity for a minimum of 150 pre-programmed messages

k. Battery-Pack Operation Duration: minimum of 55 hours under full load

l. Power chords shall comply with the National Electrical Code (NEC) Article 600.10 Portable or Mobile Signs, paragraphs 600.10(C)(1) Cords and 600.10(C)(2) Ground-Fault Circuit Interrupter (GFCI). The cord will have integral GFCI protection located in either the attachment plug or 12 inches or less from the plug.

13. **Plastic Safety Fence**. Use 4-foot high construction orange fence manufactured by one of the following companies, or an approved equal:

    a. "Safety Fence" by Jackson Safety, Inc., Manufacturing and Distribution Center, 5801 Safety Drive NE, Belmont, Michigan, 49306. Phone (800) 428-8185.

    b. "Flexible Safety Fencing" by Carsonite Composites, LLC, 19845 U.S. Highway 76, Newberry, South Carolina, 29108. Phone (800) 648-7916.

    c. "Reflective Fencing" by Plastic Safety Systems, Inc., 2444 Baldwin Road, Cleveland, Ohio 44104. Phone (800) 662-6338.

14. **Temporary Sidewalk Surfacing**. Provide temporary sidewalk surfacing as required by an approved TCP and the following:

    a. Use plywood at least 1/2-inch thick for areas continuously supported by subgrade. Use plywood at least 1 inch thick for areas that are not continuously supported.

    b. Do not use unsupported 1-inch plywood longer than 30 inches.

    c. Use plywood with regular surfaces. Do not overlap plywood joints higher than 1/2-inch. Bevel overlap joints so the maximum slope of the overlapping edge is 2 horizontal to 1 vertical.

    d. Fasten so wind and traffic will not displace temporary surfacing.

15. **Temporary Guardrail**. Use temporary guardrail that meets Section 606, except that posts may require placement under special conditions, such as in frozen ground.

16. **Flagger Paddles**. Use flagger paddles with 24 inches wide by 24 inches high sign panels, 8 inch Series C lettering (see ASDS for definition of Series C), and otherwise conform to the ATM. Use retroreflective sheeting that meets ASTM D4956 Type VIII, IX or XI. Use background colors of fluorescent orange on one side and red on the other side.

17. **Truck Mounted Attenuator, TMA**. The TMA shall be mounted on a vehicle with a minimum weight of 15,000 pounds and a maximum weight per the manufacturer's recommendations.

18. **Portable Steel Barriers**. Use portable steel barriers that conform to the contract. For each direction of traffic, equip each section of barrier with side-mounted retroreflective tabs placed approximately 6 to 8 feet apart, or a continuous 4-inch wide horizontal retroreflective stripe mounted 6 inches below the top of the barrier. Use yellow tabs or stripe when barriers are placed at centerline. Use white tabs or stripe when barriers are placed on the roadway shoulder. Use retroreflective sheeting that meets ASTM D4956 Type III, IV, or V.

19. **Flexible Markers**. Refer to Subsection 606-2.01 Materials.

643-2.02 CRASHWORTHINESS. Temporary Work Zone devices, including portable barriers, manufactured after December 31, 2019, must have been successfully tested to the 2016 edition of Manual for Assessing Safety Hardware (MASH). Such devices manufactured on or before this date, and successfully tested to National Cooperative Highway Research Program (NCHRP) Report 350 or the 2009 edition of MASH, may continue to be used throughout their normal service lives.

Submit documentation, by the method indicated on table 643-2, that the following devices comply with Test Level 3 requirements of National Cooperative Highway Research Program (NCHRP) Report 350 or the Manual for Assessing Safety Hardware (MASH). Submit documentation of compliance to the Engineer before installing devices on the project.

TABLE 643-2
WORK ZONE TRAFFIC CONTROL DEVICE AND BARRIER CRASH TESTING COMPLIANCE

Category	Devices	Devices Manufactured Before Dec. 31, 2019[1]	Devices Manufactured after Dec. 31, 2019[1]	Method of Documentation
1	Low-mass single-piece devices w/o attachments; traffic cones, tubular markers, single piece drums, delineators	NCHRP 350, MASH 2009, or MASH 2016	MASH 2016	Manufacturer's Certification for devices exceeding height and weight limits
2	Category 1 devices with attachments, barricades, portable sign supports, drums w/lights, other devices weighing less than 100 pounds but not included in Category 1	NCHRP 350, MASH 2009, or MASH 2016	MASH 2016	FHWA eligibility letter, if available, at Test Level 3[2], or DOT&PF eligibility determination
3	Fixed sign supports, truck mounted attenuators, temporary crash cushions, bridge railing, bridge and guardrail transitions, and guardrail and barrier end treatments.	NCHRP 350, MASH 2009, or MASH 2016	MASH 2016	FHWA eligibility letter, if available, at Test Level 3[2], or DOT&PF eligibility determination
	Portable Concrete and steel barriers	NCHRP 350, MASH 2009, or MASH 2016	MASH 2016	FHWA eligibility letter, if available, at Test Level 3, or DOT&PF eligibility determination, unless otherwise required in the Contract

1 The Engineer will determine whether a device is in serviceable condition. Serviceable means the device will function equivalent to a new device of the same manufacture.
2 When no test level is specified in a FHWA Eligibility letter; it is implied that the tests were run for Test Level 3.

In Table 643-2, Category 1 devices that exceed the following weights and heights require certification that they meet the evaluation criteria of NCHRP Report 350 or MASH, Test Level 3. This certification may be a one-page affidavit signed by the vendor. Documentation supporting the certification (crash tests and/or engineering analysis) must be kept on file by the certifying organization. No certification is required for devices less than or equal to both the weight and height on the schedule below:

Device	Composition	Weight	Height
Cones	Rubber	20 lb.	36 in.
	Plastic	20 lb.	48 in.
Candles	Rubber	13 lb.	36 in.
	Plastic	13 lb.	36 in.
Drums	Hi Density Plastic	77 lb.	36 in.
	Low Density Plastic	77 lb.	36 in.
Delineators	Plastic or Fiberglass	N/A	48 in.

643-3.01 GENERAL CONSTRUCTION REQUIREMENTS. Keep the work, and portions of the project affected by the work, in good condition to accommodate traffic safely. Provide and maintain traffic control devices and services inside and outside the project limits, day and night, to guide traffic safely.

Unless otherwise provided in this Section, keep all roadways, business accesses, and pedestrian facilities within the project limits open to traffic. Obtain the Engineer's approval before temporarily closing residential, commercial, or street approaches. Provide access through the project for emergency vehicles and school and transit buses. Properly sign and/or flag all locations where the traveling public is redirected or stopped. Organize construction operations so the total of all construction related stoppages experienced by a vehicle traveling through the project does not exceed 20 minutes except when indicated otherwise in the Contract.

Stop equipment at all points of intersection with the traveling public unless an approved TCP shows otherwise.

Continue to operate all illumination and signalization according to the requirements of Subsection 660-3.09. When moving approach lanes, realign signal heads as necessary according to the ATM. Coordinate any modifications to existing traffic signals with the agency that maintains and operates them. Operate flood lighting at night according to the ATM. Adjust flood lighting so that it does not shine into oncoming traffic.

Provide and maintain safe routes for pedestrians and bicyclists through or around traffic control zones at all times, except when regulations prohibit pedestrians or bicyclists. Station a flagger, where construction activity encroaches onto the safe route in a traffic control zone, to assist pedestrians, and bicyclists past the construction activity.

Maintain business access(s) during flagging operations.

Immediately notify the Engineer of any traffic related accident that occurs within the project limits as soon as an employee or a subcontractor becomes aware of the accident.

643-3.02 ROADWAY CHARACTERISTICS DURING CONSTRUCTION. Obtain an approved TCP before reducing existing roadway lane and shoulder widths and before starting construction. Maintain a clear area with at least 2 feet between the edge of traveled way and the work area. Use barricades, traffic cones, or drums to delineate this area. Place traffic control devices on the work side of the clear area. Space them according to the ATM.

Where specified in the Plans, Specifications, Special Provisions, and or the TCP: traffic may be maintained on a continuous gravel surface.

1. **Specified Gravel Surface**. Traffic may be maintained on a continuous gravel surface where specified:

   a. NA Highway: NA weeks.

   b. BOP to Station NA : No time restriction.

   c. Station NA to Station NA (or EOP).

   d. Other project roadways: NA, no time restriction.

2. **Gravel Surface Not Specified**.

   a. Through traffic shall not traverse more than two gravel sections of roadway in any given period.

   b. Pavement Break(s) for Culvert or Utility Work: Patch pavement breaks(s), with hot mix asphalt, not more than 48 hours after removing the existing pavement.

   c. When approved by the Engineer.

3. **Construction Detours**.

   a. Construction detours for culvert installation may be left unpaved for no more than 7 days. If it is expected that the detour will be required for more than 7 days it shall be surfaced with temporary asphalt.

If maintaining traffic on an unpaved surface, provide a smooth and even surface that public traffic can use at all times. Properly crown the roadbed surface for drainage. Before beginning other grading operations, place sufficient fill at culverts and bridges to permit traffic to cross smoothly and unimpeded. Use part-width construction techniques when routing traffic through roadway cuts or over embankments under construction. Excavate the material or place it in layers. Alternate the construction activities from one side to the other. Route the traffic over the side opposite the one under construction.

Detour traffic when the Plans or an approved TCP allows. Maintain detour routes so that traffic can proceed safely. When detours are no longer required, obliterate the detour. Topsoil and seed appropriate areas.

If two-way traffic cannot be maintained on the existing roadway or detour, use half-width construction or a road closure if it is shown on an approved TCP. Make sure the TCP indicates closure duration and conditions. Schedule the roadway closures to avoid delaying school buses, and peak-hour traffic. For road closures, post closure-start and road-reopen times at the closure site, within view of waiting traffic.

Pave lanes next to the median first. Pave lanes next to exit and entrance ramps last. Place temporary 12:1 sloped wedge of asphalt concrete against the abrupt pavement edge on lanes next to exit and entrance ramps. Do not open the roadway to traffic until slope wedges are in place.

643-3.03 PUBLIC NOTICE. Give notice at least 3 days before major changes, delays, lane restrictions, or road closures to local officials and transportation organizations, including but not necessarily limited to:

- Alaska Trucking Association
- Alaska State Troopers
- Division of Measurement Standards
- Local Police Department
- Local Fire Department
- Local Government Traffic Engineer
- School and Transit Authorities

- Local Emergency Medical Services
- Local Media (newspapers, radio, television)
- Railroads (where applicable)
- U.S. Postal Service
- Major Tour Operators

Provide local traffic enforcement and maintenance agencies 24-hour notice before shutting down a traffic signal system. Provide notice as required by utility companies before repairing or replacing a utility.

Provide the Alaska State Troopers, local police and fire department with the radio frequencies used on the project and the 24-hour telephone numbers of the Worksite Traffic Supervisor and the Project Superintendent. These telephone numbers are used to alert construction employees when emergency vehicles must pass through the project. When notified of emergencies make every necessary effort to expedite rapid passage.

Additional notices may be given through the Navigator or 511 System for selected projects. Check the special provisions for those requirements.

643-3.04 TRAFFIC CONTROL DEVICES. Before starting construction, erect permanent and temporary traffic control devices required by the approved TCPs. The Engineer will determine advisory speeds when necessary.

For lane closures on multilane roadways, use sequential arrow panels. During hours of darkness when required by the approved TCP, use flashing warning lights to mark obstructions or hazards and steady-burn lights for channelization.

Use only one type of traffic control device in a continuous line of delineating devices, unless otherwise noted on an approved TCP. Use drums or Type II barricades for lane drop tapers.

During non-working hours and after completing a particular construction operation, remove all unnecessary traffic control devices. Store all unused traffic control devices in a designated storage area which does not present a nuisance or visual distraction to traffic. If sign panels are post mounted and cannot be readily removed, cover them entirely with either metal or plywood sheeting. Completely cover signal heads with durable material that that fully blocks the view of signal head and will not be damaged or removed by weather.

Keep signs, drums, barricades, and other devices clean at all times.

Use only traffic control devices that meet the requirements of the “Acceptable” category in ATSSA (American Traffic Safety Services Association) “Quality Guidelines for Temporary Traffic Control Devices” and meet crashworthiness requirements per Section 643-2.02.

Immediately replace any devices provided under this Section that are lost, stolen, destroyed, inoperable or deemed unacceptable while used on the project. Stock repair parts for each Temporary Crash Cushion used on the project. Repair damaged crash cushions within 24 hours.

Maintain pre-existing roadside safety hardware at an equivalent or better level than existed prior to project implementation until the progress of construction necessitates removing the hardware. All existing hazards that are currently protected with roadside safety hardware or new hazards which result from project improvements shall be protected or delineated as required in the plans, specifications, and approved TCPs until permanent roadside safety hardware is installed. All temporary roadside safety hardware shall meet crashworthiness requirements of Subsection 643-2.02.

All items paid under this Section remain the property of the Contractor, unless noted otherwise in the contract. Remove them after completing the project.

1. **Embankments**. Close trenches and excavations at the end of each continuous work shift, except as indicated by the Engineer.

Install portable concrete or steel barrier, plastic drums, barricades, tubular markers, plastic safety fence, and cones as specified on the Plans or TCPs to delineate open trenches, ditches, other excavations, and hazardous areas when they exist along the roadway for more than one continuous work shift.

2. **Adjacent Travel Lane Paving**. When paving lifts are 2 inches or greater and you cannot finish paving adjacent travel lanes or paved shoulders to the same elevation before the end of the paving shift, install: W8-11 (Uneven Lanes), W8-9 (Low Shoulder), W8-17 (Shoulder Drop-Off), W14-3 (No Passing Zone), R4-1 (Do Not Pass), R4-2 (Pass with Care), and W8-1 (Bump) signs as appropriate. Place additional signs every 1500 feet if the section is longer than 1/2 mile.

3. **Fixed Objects, Construction Vehicles and Equipment Working On or Next to the Traveled Way**. Do not park equipment in medians. Locate fixed objects at least 30 feet from the edge of traveled way. Fixed objects that exist prior to construction activity are not subject to this requirement unless the proposed temporary traffic routing moves the edge of traveled way closer to the pre-existing fixed object. Vehicles and other objects within parking lots in urban environments are considered preexisting fixed objects regardless of whether they are or are not present continuously throughout the day.

   When worksite restrictions, land features, right of way limitations, environmental restrictions, construction phasing, or other construction conditions allow no practicable location meeting the preceding requirements, the Engineer may approve alternate locations for fixed objects. Alternate locations shall be as far as practicable from the edge of traveled way. When the alternate location provides 15 feet or more separation from the edge of traveled way, the Engineer may verbally approve the alternate location. When the alternate location provides less than 15 feet separation, written approval is required.

   When the Engineer determines a fixed object or fixed objects present unacceptable hazard, use drums, or Type II barricades with flashing warning lights, or use portable concrete or steel barriers, or temporary crash cushion to delineate or shield the hazard, as approved by the Engineer.

   Remove obstructions greater than 4 inches above the nominal foreslope grade at the end of each continuous work shift.

4. **Flagging**. Furnish trained and competent flaggers and all necessary equipment, including lighting of the flagging position during nighttime operations, to control traffic through the traffic control zone. The Engineer will approve each flagging operation before it begins and direct adjustments as conditions change.

   Flaggers must be certified as one of the following:

   a. Flagging Level I Certification by IMSA

   b. Flagger Certification by ATSSA

   c. Traffic Control Supervisor, ATSSA

   d. Work Zone Safety Specialist, IMSA

   e. ATSSA Flagging Instructor

   Flaggers shall maintain current flagger certification. Flaggers must be able to show their flagger certification anytime they are on the project.

   Flaggers must maintain their assigned flagging location at all times, unless another qualified flagger relieves them, or the approved traffic control plan terminates the flagging requirements. Remove, fully cover, or lay down flagger signs when no flagger is present. Keep the flaggers' area free of encumbrances. Keep the flagger's vehicle well off the roadway and away from the flagging location so the flagger can be easily seen.

Provide approved equipment for two-way radio communications between flaggers when flaggers are not in plain, unobstructed view of each other.

Obtain the Engineer's written approval before flagging signalized intersections. When flagging a signalized intersection, either turn off and cover the traffic signal or place it in the All-Red Flash mode. Coordinate changing traffic signal modes and turning off or turning on traffic signals with the agency responsible for signal maintenance and operation and the Engineer. Get their written approval in advance. Only uniformed police officers are permitted to direct traffic in an intersection with an operating traffic signal.

5. **Pilot Cars**. You may use pilot cars when part of an approved TCP, if the Engineer determines one-way traffic is necessary, or if the route through the traffic control zone is particularly hazardous, involved, or frequently altered to preclude adequate signing, Do not use pilot cars to avoid localized traffic control at several locations. Pilot car operators may not control Automated Flagger Assistance Devices while operating a pilot car.

   Organize construction operations so the total of all stoppages experienced by a vehicle traveling through a project does not exceed 20 minutes. However, this does not imply that you may allow 20 minutes in all cases. Coordinate multiple pilot-car operations within a project or adjoining projects to minimize inconvenience to the traveling public. Two or more pilot cars may be used to provide two-way traffic through the traffic control zone to reduce the waiting period. The flagger or pilot car operator must record each pilot car's departure time in a bound field book furnished by the Engineer. Whenever practical, the flagger should tell the motorist the reason for and approximate length of the delay. Make every reasonable effort to yield right-of-way to the public and prevent excessive delay.

   Use an automobile or pickup as the pilot car, with the company logo prominently displayed. Equip the pilot car with a two-way radio for contact with flaggers and other pilot cars. Mount a G20-4 sign (Pilot Car Follow Me) on the rear at least 5 feet above the driving surface. Use high intensity flashing strobe lights, oscillating beacons, or rotating beacons on all Pilot Cars. Vehicle hazard warning lights may supplement but are not permitted to be used instead of high intensity flashing strobe lights, oscillating beacons, or rotating beacons. Identify the last vehicle in the column.

   When pilot car operations are approved, establish all required pilot car traffic control devices before beginning work. Continue pilot car operations until no longer necessary and an approved TCP is in place for operations without pilot car, including all required traffic control devices.

6. **Street Sweeping and Power Brooming**. Keep free of loose material paved portions of the roadway and haul routes open to the public, including sections of roadway off the project where the Contractor's operations have deposited loose material. Use equipment for brooming and sweeping as recommended by the manufacturer and the following:

   Dirt, dust and construction materials, mobilized as a result of power brooming and or sweeping, shall not be pushed, ejected, thrown or drift beyond the lesser of, 2 feet from the equipment perimeter or the edge of the paved surface.

   All equipment shall operate to typical industry standards. Maintain equipment to operate as designed by the manufacturer. Equipment will employ safety equipment, warning lights, and other as required by the Specifications and these Special Provisions.

   Sweeper and Broom Options: Table 643-5, Traffic Control Rate Schedule, Street Sweeping

   a. Regenerative Sweeper: Sweeper that blows a stream of air at the paved surface, causing fine particles to rise, and then caught through a vacuum system.
   b. Vacuum Sweeper: Sweeper that creates a vacuum at the paved, surface sucking dirt, dust, and debris into a collection system.
   c. Mechanical Broom Sweeper: Sweeper designed to pick up and collect larger size road debris, stones and litter, etc. In addition to the requirements noted in these Specifications, use of a mechanical broom sweeper requires the Engineer to approve the sweeper for the intended use.

d. Power Broom: Power brooming that wets, pushes and or ejects loose material directly into an attached collection/pickup container may be used when approved by the Engineer. The added moisture will be contained to the paved roadway surface.

   Dry Power Brooming is not permitted. Power brooming without direct/immediate means of collection/pickup is not permitted.

7. **Watering**. Furnish, haul, and place water for dust control and pavement flushing, as directed. Use water trucks that can provide a high-pressure water stream to flush the pavement and a light-water spray to control dust. If the flushing operations contaminate or fill adjacent catch basins, clean and restore them to their original condition. This requirement includes sections of roadway off the project where flushing is required. The Engineer will control water application.

   Obtain an Alaska Department of Natural Resources permit for water removal before taking water from a lake, stream, or other natural water body. Comply with the Alaska Department of Fish and Game screening requirements for all water removal operations.

8. **Portable Changeable Message Board Signs**. Furnish Changeable Message Signs when approved on a TCP. Display only messages approved on the TCP. Follow application guidelines in the ATM.

9. **Truck Mounted Attenuator (TMA)**. TMAs are mounted on the rear of work vehicles. Impact attenuators shall meet crashworthiness requirements of 643-2.02. TMAs shall be mounted on a vehicle with a minimum weight of 15,000 pounds and a maximum weight in accordance with the manufacturer's recommendations. TMAs shall have an adjustable height so that it can be placed at the correct elevation during usage and to a safe height for transporting. Approach ends of TMAs shall have impact attenuator markings in accordance with the ATM. Do not use a damaged attenuator in the work. Replace any damaged TMA at your expense.

10. **Traffic Control Vehicles**. Use high intensity flashing strobe lights, oscillating beacons, or rotating beacons on the Work Zone Supervisor's vehicle and on vehicles being used to transport and set-up traffic control devices. Vehicle hazard warning lights may supplement but are not permitted to be used instead of high intensity flashing strobe lights, oscillating beacons, or rotating beacons.

643-3.05 AUTHORITY OF THE ENGINEER. When existing conditions adversely affect the public's safety or convenience, the Contractor will receive an oral notice, and then a written notice according to Subsection 105-1.01, Authority of the Engineer. The notice will state the defect(s), the corrective action(s) required, and the time required to complete the corrective action(s). In no case shall this time exceed 24 hours. If corrective action(s) are not completed within the specified time, the Engineer may immediately suspend work on the offending operations until the defect(s) are corrected. The Engineer may require outside forces to correct unsafe conditions. The cost of work by outside forces will be deducted from any monies due under the terms of this Contract.

643-3.06 TRAFFIC PRICE ADJUSTMENT. A Traffic Price Adjustment, under Item 643.0023.____, will be assessed for unauthorized lane closures or reductions. Unauthorized lane reductions will be assessed as one full lane closure, for each lane reduced without authorization.

Authorized lane closures and/or lane reductions are those shown in the Contract, an approved TCP, or authorized in writing.

Unauthorized lane reductions include unacceptable roadway, pedestrian walkway or route, and bicycle route or pathway surfaces, such as severe bumps, ruts, washboarding, potholes, excessive dust or mud, and non-conforming or out of place traffic control devices. Failure to install temporary crash cushions or barriers, when required according to the Contract or TCP, is also considered an unauthorized lane reduction. The Engineer will make the sole determination whether unauthorized lane reductions or closures are present.

Failure to maintain an acceptable infrastructure or traffic control plan will result in a price adjustment equal to 100 percent of the applicable rate shown in Table 643-3, Adjustment Rates, for the time the roadway or pedestrian facility is in an unacceptable condition.

The rates are liquidated damages which represent highway user costs, based on Average Daily Traffic (ADT). The Engineer will use the rate shown for the current ADT for this project, as published in the Regional Traffic Volume Report prepared by the Department's Planning Section. Adjustment rates for unauthorized reduction or closure of each lane of pedestrian walkways or route, and bicycle route or pathway, are the same as for one full roadway lane closure.

TABLE 643-3
ADJUSTMENT RATES

Published ADT	Dollars/Minute of Delay/Lane
0 – 5,000	$30
5,000 +	$40

643-3.07 MAINTENANCE OF TRAFFIC DURING SUSPENSION OF WORK. Approximately one month before work is suspended for the season, schedule a preliminary meeting with the Engineer and Maintenance & Operations to outline the anticipated roadway condition and the work expected to be completed before shutdown. Schedule a field review with the Department for winter maintenance acceptance. At the field review, the Engineer will prepare a punch list for implementation before acceptance.

To be relieved of winter maintenance responsibility, leave all roads with a smooth and even surface for public use at all times. Properly crown the roadbed surface for drainage and install adequate safety facilities. Make sure all illumination and signals, including vehicle detectors, are in good working order.

After the project is accepted for winter maintenance and until ordered to resume construction operations, the Department is responsible for maintaining the facility. The Department will accept maintenance responsibility only for portions of the work that are open to the public, as determined by the Engineer. The Department will not accept maintenance responsibility for incomplete work adjacent to accepted roads. The contractor is responsible for maintaining all other portions of the work. The Engineer will issue a letter of “Acceptance for Winter Maintenance” that lists all portions of the work that the Department will maintain during a seasonal work suspension. The contractor retains all contractually required maintenance responsibilities until receipt of this letter.

If the contractor suspends work due to unfavorable weather (other than seasonal) or due to failure to correct unsafe conditions, carry out Contract provisions, or carry out the Engineer’s orders. All costs for traffic maintenance during the suspended period will be borne by the Contractor.

When work is resumed, replace or renew any work or materials lost or damaged during temporary use. If the Department caused damage during winter suspension, payment will be made for repairs by unit pay item or in accord with Subsection 109-1.05, Compensation for Extra Work. When the Engineer directs, remove any work or materials used in the temporary maintenance. Complete the project as though work has been continuous.

643-3.08 CONSTRUCTION SEQUENCING. The construction sequencing detailed in these provisions, the Special Provisions, and the Plans is suggested only. The Contractor may propose alternative construction sequencing.

Throughout the project, maintain the existing roadway, pedestrian walkway, or route, and bicycle route or pathway configuration (such as the number of lanes and their respective widths) except for restrictions to traffic allowed in the Special Provisions or on the Plans, and addressed through approved TCPs. A restriction to traffic is any roadway surface condition, work operation, or traffic control setup that reduces the number of lanes or impedes traffic. Obtain an approved TCP before restricting traffic.

Unless otherwise determined by the Engineer and on an approved Traffic Control Plan (TCP), do not restrict traffic during the times listed below:

1. May 1 to September 30:

    a. Monday through Thursday: 0600 hrs to 2100 hrs.

    b. Weekends: Friday 0600 hrs to Sunday 2200 hrs.

2. October 1 to April 30:

    a. Monday through Thursday: 0600 hrs to 0800 hrs.

3. Around any Holiday:

    a. If a holiday falls on Sunday, Monday, or Tuesday, the above stipulations apply from 1200 hrs on the Friday before the holiday to 0300 hrs. on the day after the holiday.

    b. If a holiday falls on Wednesday, the above stipulations apply from 1200 hrs on the Tuesday before the holiday to 0300 hrs. on the Thursday after the holiday.

    c. If a holiday falls on Thursday, Friday, or Saturday, the above stipulations apply from 1200 hrs on the day before the holiday to 0300 hrs. on the Monday after the holiday.

4. October 1 to April 30 Full Road Closure: A total of 02 full closures for up to 6 hours each will be allowed Monday through Thursday evenings between the hours of 2100 and 0500 for various work items. Work items include, but are not limited to culvert replacement and installation. Two week notification to the public required for closure.

Lane restrictions, if allowed, conducted so that no more than a 10 minute accumulated stopped delay, 40 vehicles, or 1/4 mile (1320 feet) of traffic detained, whichever occurs first, before releasing the detained motorists. During paving operations, a 20 minute stopped delay, 80 vehicles, or 1/2 mile (2640 feet) of traffic detained, allowed for motorists, except school buses. If a queue of traffic develops at a stop, empty the entire queue to include the last car that entered the queue at the time the queue was released.

Do not delay the school busses through the construction zone; obtain the local school bus schedule and coordinate work efforts. Submit the plan, as a TCP, to the Engineer for approval before the implementation of the school bus coordination plan.

643-3.09 INTERIM PAVEMENT MARKINGS. Place permanent or interim pavement markings according to this Subsection, details shown on the Plans, approved TCPs, and Parts III and VI of the ATM before opening existing paved roadways, temporary paved roadways, detours, interim paving lifts, and roadways with seal coats and surface treatments for more than one continuous work shift. This work may include restriping the existing roadway before beginning construction, before seasonal suspension, and/or after seasonal suspension.

Remove conflicting pavement markings according to Subsection 670-3.04, Paint Removal.

Mark existing roadway sections that will be opened to traffic during the winter. Mark over the existing lines and markings, unless shown otherwise on the Plans or an approved TCP.

Maintain all interim pavement markings for their intended life including reapplication when necessary. There will be no compensation to upgrade interim pavement markings required for work operations lasting up to 2 weeks.

Use only temporary raised pavement markers as interim pavement markings on final pavement surfaces. Completely remove and dispose of them when placing the final markings. Completely remove any residual adhesive that might misguide motorists. Place final pavement markings on finished pavement surfaces and interim pavement surfaces before suspending work for the winter.

Stage the construction to avoid routing traffic over conflicting markings, for more than one continuous work shift. If traffic is routed over conflicting markings during a work shift, delineate the roadway with a complement of warning signs, channelizing devices, and flaggers as required by the ATM.

Use only temporary raised pavement markers meeting Subsection 712-2.16 as interim markings on seal coat and surface treatment pavements. Install the markers according to the manufacturer's instructions before applying the asphalt surface material and cover coat. Remove the vinyl protective covers after applying the asphalt pavement.

On multicourse surface treatments, install the temporary raised pavement markers after applying the full width of the first layer of cover coat. Install the markers on each day's completed surface before removing the pilot car operations and allowing unescorted traffic on the surface treatment.

Apply final pavement markings according to Subsection 670-3.01, Construction Requirements, of these Special Provisions.

Do not place final pavement markings until traffic has traveled over the seal coat or surface treatment for at least 15 days and no more than 21 days, as directed by the Engineer.

643-3.10 LIGHTING FOR NIGHT WORK. Illuminate the night work areas according to Table 643-4.

Table 643-4 does not provide a comprehensive list of operations that require lighting. Provide lighting for other operations when necessary.

Use balloon lighting as the main light sources. Do not use floodlights without prior approval by the Engineer. When approved, install floodlighting in a manner that minimizes glare for motorists, workers, and residents living along the roadway. Locate, aim, louver, and/or shield light sources to reduce glare.

The Engineer shall be the sole judge of when glare is unacceptable, either for traffic or for adjoining residences. When notified of unacceptable glare, modify the lighting system to reduce glare to an acceptable level.

TABLE 643-4
NIGHT WORK ILLUMINATION EQUIPMENT AND LOCATION REQUIREMENTS

Type of Work or Equipment	Lighting Configuration
Paving, Milling, Striping, Pavement Marking Removal, Rumble Strip Installation.	At least one machine-mounted balloon light of at least 2000 watts. Provide additional lights or wattage if necessary to provide complete coverage.
Rolling, pavement sweeping.	At least 4 sealed beam halogen lamps in the front and four in the back. Each should be at least 55 watts.
Flagging.	One balloon light of at least 2000 watts, located within 30 feet of the flagger location. Locate so the flagger and the flagging location are illuminated. Provide additional lights or wattage if necessary to provide complete coverage of the flagging location.
Truck Crossings where haul vehicles cross or enter a road with more than 10,000 ADT, or where the haul vehicle crossing or entering location is controlled by portable traffic signals or flaggers.	At least one balloon light of at least 2000 watts, located on the main road on the far right side of the intersection. Locate light within 30 feet of the edge of the side street. If there is a flagger at the crossing, locate the lights or lights so the lighting requirements for Flagging are also satisfied.

If the Contractor fails to provide required lighting equipment or provides lighting that creates unacceptable glare, the Contractor shall cease all construction activities that require illumination, including flagging operations, until the condition or conditions are corrected.

Use lighting equipment in good operating condition and that complies with applicable state and local adopted codes and standards, and OSHA, NEC, and NEMA requirements.

Provide suitable brackets and hardware to mount lighting fixtures and generators on machines and equipment. Design mountings so lights can be aimed and positioned as necessary to reduce glare. Locate mounting brackets and fixtures so they don't interfere with the equipment operator or overhead structures. Connect fixtures securely in a manner that minimizes vibration.

Ensure ground, trailer, and equipment-mounted light towers or poles are sturdy and freestanding without the aid of guy wires. Towers shall be capable of being moved as necessary to keep pace with the construction operation. Position the ground and trailer-mounted towers and trailers, to minimize the risk of being impacted by traffic on the roadway, or by construction traffic, or equipment.

Raise trailer or equipment mounted lights to maximum height, except do not exceed the clearance required for overhead objects such as overhead signals, overhead signs, trees, aerial utilities, or bridges. Aim and adjust lights to provide the required light levels. Provide uniform illumination on the hopper, auger, and screed areas of pavers. Illuminate the operator's controls on all machines uniformly.

Furnish each side of non-street legal equipment with a minimum of 75 square inches high intensity retroreflective sheeting in each corner, so at least 150 square inches of sheeting is visible from each direction. Provide red sheeting on the rear of the equipment and yellow sheeting elsewhere.

Existing street and highway lighting and conventional vehicle headlights may supplement but do not relieve the Contract requirement to provide lighting for night work, according to the requirements of Table 643-4.

Provide sufficient fuel, spare lamps, spare generators, and qualified personnel to ensure that all required lights operate continuously during nighttime operations. Ensure generators have fuel tanks of sufficient capacity to permit operation of the lighting system for a minimum of 12 hours. In the event of any failure of the lighting system, discontinue the operation that requires illumination until the required level and quality of illumination is restored.

Maintain a supply of at least twenty emergency flares for use in the event of emergency or unanticipated situations. Comply with local noise ordinances.

Install all post-mounted electroliers located within the clear zone, on NCHRP 350 or MASH compliant breakaway bases.

643-3.11 HIGH VISIBILITY GARMENTS. Ensure all workers within project limits wear outer garments that are highly visible and comply with the following requirements:

1. **Standards**. Use high visibility garments conforming to the requirements of ANSI/ISEA 107-2004, Class 2 for tops or Class E for bottoms, and Level 2 retroreflective material.

2. **Labeling**. Use garments labeled in conformance with Section 11.2 of ANSI/ISEA 107-2004 or ANSI/ISEA 107-2010.

3. **Tops**. Wear high visibility vests, jackets, or coverall tops at all times.

4. **Bottoms**. Wear high visibility pants or coverall bottoms during nighttime work (sunset to sunrise). Worksite traffic supervisors, employees assigned to traffic control duties, and flaggers wear high visibility pants or coverall bottom at all times.

5. **Outer Raingear**. Wear raingear tops and bottoms conforming to the requirements of this Subsection 643-3.11.

6. **Exceptions**. When workers are inside an enclosed compartment of a vehicle, they are not required to wear high visibility garments.

7. **Condition**. Furnish and maintain all vests, jackets, coveralls, rain gear, hard hats, and other apparel in a neat, clean, and presentable condition. Maintain retroreflective material to Level 2 standards.

Payment for high visibility garments for workers is subsidiary to other traffic contract items.

643-4.01 METHOD OF MEASUREMENT. Section 109 and as follows: Quantities will not be measured during winter suspension of work.

1. **Traffic Maintenance**. Calendar Day: Every day shown on the calendar, beginning and ending at midnight. Measurement begins on the day following receipt of the Notice to Proceed or on the first day of work at the project site, whichever is later, and ends on the date of project completion.

2. **Traffic Control Device Items**. By the number of units of each bid item shown on the bid schedule (or the Traffic Control Rate Schedule, if item 643.0025.____, Traffic Control, is included) that are installed, accepted, and operational. Incomplete or unsatisfactory devices will not be measured. Special Construction Signs are measured by the total area of legend-bearing sign panel, as determined under Subsection 615-4.01. Compensation for a 24-hour period shall be made under Construction Signs in the Traffic Control Rate Schedule, Table 643-5. Items measured by the day are for each item per 24-hour period.

3. **Traffic Maintenance Setup Items**. By each lane closure or one-lane road in place per hour. By each detour or road closure in place per 24-hour period.

4. **Portable Concrete Barrier**. By each nominal 12.5-foot section placed according to the approved TCPs, for the initial placement and for each subsequent relocation when moved more than 10 feet in any direction. Each transition piece (sloping end) will be measured as a single section.

5. **Temporary Crash Cushion**. By each acceptable installation.

6. **Interim Pavement Marking**. By the single-stripe station. A single stripe is a marking or a temporary raised pavement marker 4 inches wide. Wider striping is measured in multiples of 4 inches. Centerline gaps are not deducted from measurements.

7. **Flagging and Pilot Car**. By the number of approved hours, supported by certified payroll.

8. **Street Sweeping**. By the number of operated hours, supported by certified payroll and approved by the Engineer.

9. **Watering**. By the 1,000 gallons (M-Gallon) of water applied. The Engineer may specify measurement by weight or volume. If by weight, convert to gallons at 8.34 pounds per gallon. If by volume, convert to gallons at 7.48 gallons per cubic foot.

10. **Traffic Price Adjustment**. By each minute that any lane of traffic is not open to full use by the traveling public, measured to the nearest minute. The Engineer will determine whether the roadway is opened to full use.

11. **Traffic Control**. By the units specified in the Special Provisions.

12. **Portable Changeable Message Board Sign**. By the 24-hour period for each sign, as shown on an approved TCP and displaying an approved message.

13. **Plastic Safety Fence**. By the linear foot, as placed, to protect or channelize pedestrian traffic as shown on an approved TCP. Any adjustment in configuration of the fence at the same location that does not result in an increased amount of fence is not measured. Opening and closing the fence to gain access to and from the worksite is not measured.

14. **Temporary Sidewalk Surfacing**. By the square yard as shown on an approved TCP.

15. **Temporary Guardrail**. By the linear foot, including end treatments, as shown on an approved TCP.

16. **Portable Steel Barrier**. By the linear foot placed according to the manufacturer's recommendation and approved TCPs, for the initial placement, and for each subsequent relocation when moved more than 10 feet in any direction.

17. **Hotline Road Report**. No measurement required to provide a 24-hour toll free (1-800 ###-####) "Hotline Road Report" telephone with a prerecorded message, and weekly notices with daily updates. Work will be subsidiary to Pay Item 643.0001.____ or 643.0002.____, Traffic Maintenance.

643-5.01 BASIS OF PAYMENT.

1. **Traffic Maintenance**. The contract price includes all resources required to provide the Worksite Traffic Supervisor, all required TCPs and public notices, the Construction Phasing Plan, and the maintenance of all roadways, approaches, crossings, intersections and pedestrian and bicycle facilities, as required. This item also includes any Traffic Control Devices required but not shown on the bid schedule.

   Items required by the Contract that are not listed on the bid schedule or not included in other items are subsidiary to Item 643.0001.____ or 643.0002.____ Traffic Maintenance, except the following:

   Traffic Price Adjustment
   Traffic Maintenance Setup

2. **Traffic Control Device Items**. The contract price includes all resources required to provide, install, maintain, move, and remove the specified devices. Warning lights, high-level warning devices, vertical panels, and sign supports required for traffic control devices are subsidiary.

3. **Traffic Maintenance Setup Items**. Each setup consists of all traffic control devices, flaggers, pilot cars, and subsidiary items necessary to implement the TCP shown on the Plans. Warning lights, high-level warning devices, vertical panels, and sign supports required for traffic control devices are subsidiary.
   Construction and obliteration of temporary roadways, when required on the Plans or approved TCP under a traffic maintenance setup item, is paid for under their respective roadway pay items.

   When topsoil or seeding is required for detours, payment will be made under Sections 620 and/or 618.

4. **Portable Concrete Barrier**. The contract price includes all resources required to provide, install, maintain, and remove each barrier section.

5. **Temporary Crash Cushion**. The contract price includes all resources required to provide, install, maintain, repair, and remove each crash cushion.

6. **Interim Pavement Marking**. The contract price includes all resources required to provide, install, maintain, and remove the specified markings. Installation of word and symbol markings are subsidiary. The No-Passing Zone signing, described in Subsection 643-3.04, is subsidiary.

7. **Flagging and Pilot Car**. The contract price includes all required labor, vehicles, radios, flagger paddles and pilot car signs, and transportation to and from the worksite.

   The Engineer will pay for Item 643.0032.____ Flagging on a contingent sum basis at the rate of $58.00/hour. The Engineer does not require a change order/directive for the flagging Pay Item. Flagging associated with Change Order work paid at the prices according to Subsection 109-1.05 Compensation for Extra Work.

8. **Street Sweeping**. The contract price includes all resources required to keep the roadway free of loose material.

9. **Watering**. The contract price includes all resources required to provide watering, as directed.

10. **Traffic Price Adjustment**. If Item 643.0023.____, Traffic Price Adjustment, is shown on the bid schedule, the total value of this contract will be adjusted, for unauthorized lane reductions or closures, at the rates listed in Table 643-3.

11. **Traffic Control**. Payment for Item 643.0025.____, Traffic Control, will be made at the unit rate value contained in the Traffic Control Rate Schedule shown in the Special Provisions for the accepted units of traffic control devices. The Engineer does not require a change order/directive for Pay Item 643.0025.____, Traffic Control.

12. **Portable Changeable Message Board Sign**. The contract price includes all resources required to furnish, move, and operate the sign.

    Two Portable Changeable Message Board Signs used for Permanent Construction Signing paid for under Item 643.0003.____ Permanent Construction Signs. Additional portable changeable message board signs will be paid for under 643.0025.____, Traffic Control.

13. **Plastic Safety Fence**. The contract price includes all resources required to install, maintain, and remove the fence.

14. **Temporary Sidewalk Surfacing**. The contract price includes all resources required to construct, maintain, and remove the surfacing.

15. **Temporary Guardrail**. The contract price includes all resources required to construct, maintain, and remove the guardrail.

16. **Portable Steel Barrier**. The contract price includes all resources required to provide, install, maintain, move, and remove each barrier.

17. **Lighting for Night Work**. Payment for illuminating night work areas and any required adjustments to work zone illumination is subsidiary to other items.

18. **Pavement Breaks**. Temporary hot mix asphalt at pavement breaks, as noted in Subsection 643-3.02.2. Gravel Surface Not Specified is subsidiary to Pay Item 401.0001.____.

19. **Temporary Pavement Markings**. Except where specified as an individual Pay Item (Interim Pavement Markings) temporary pavement markings are subsidiary to Section 670 Pay Items. Refer to Section 670 Traffic Markings, for further information.

20. **Temporary Crash Cushion / Redirective**. The price listed in the Traffic Control Rate Schedule, Table 643-5, will be full compensation for the purchase, installation, maintenance during construction, removal, and salvaging the Temporary Crash Cushion / Redirective unit(s). Deliver the salvaged unit(s) to the nearest ADOT & PF Maintenance & Operations Station or as directed by the Engineer.

Traffic control devices, barriers, and crash cushions required to delineate or shield fixed objects will not be measured or paid for separately, but will be subsidiary

Traffic control devices, barriers, and crash cushions required to delineate or shield guardrail posts or non-crashworthy ends will not be measured or paid for separately, but will be subsidiary, when required for failure to meet completion timelines in subsection 606-3.01.

TABLE 643-5
TRAFFIC CONTROL RATE SCHEDULE

Traffic Control Device	Pay Unit	Unit Rate
Construction Signs	Each/Day	$6.50
Special Construction Signs	Square Foot	$28.00
Type II Barricade	Each/Day	$3.30
Type III Barricade	Each/Day	$11.00
Traffic Cone or Tubular Marker	Each/Day	$1.10
Drums	Each/Day	$3.30
Sequential Arrow Panel	Each/Day	$36.00
Portable Concrete or Steel F Shape Barrier (12.5 foot long or $8/foot for other lengths)	Each	$100.00
Temporary Crash Cushion / Non-redirective Water Filled Barrier (all required per end)	Each	$2500.00
Temporary Crash Cushion / Non-redirective Water Filled Barrels (all required per end)	Each	$3285.00
Temporary Crash Cushion / Non-redirective Sand Filled Barrels (all required per end)	Each	$4325.00
Temporary Crash Cushion / Redirective	Each	$9230.00
Pilot Car (4x2, 1/2 ton truck)	Hour	$72.00
Watering Truck – up to 4900 gallon capacity	M-Gallon	$28.00
Watering Truck – more than 4900 gallon	M-Gallon	$21.00
Street Sweeping: Regenerative Sweeper, Vacuum Sweeper, Mechanical or Power Broom with Vacuum	Hour	$214.00
40,000 GVW Truck with Crash Attenuator	Hour	$162.00
Plastic Safety Fence	Lineal Foot	$1.00
Portable Changeable Message Board Sign	Calendar Day	$130.00
Temporary Sidewalk Surfacing	Square Foot	$2.00
Flexible Markers (Flat Whip, Reflective)	Each	$60.00
Temporary Guardrail	Lineal Foot	$25.00

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
643.0001.____	Traffic Maintenance	CDAY
643.0002.____	Traffic Maintenance	LS
643.0003.____	Permanent Construction Signs	LS
643.0004.____	Construction Sign	Day
643.0005.____	Type II Barricade	Day
643.0006.____	Type III barricade	Day
643.0007.____	Traffic Cone/Tubular Marker	Day
643.0008.____	Plastic Safety Fence	LF
643.0009.____	Drum	Day
643.0010.____	Sequential Arrow Panel, Type C	Day
643.0011.____	Special Construction Signs	SF
643.0012.____	Portable Concrete Barrier	Each
643.0013.____	Temporary Crash Cushion	Each
643.0014.____	Interim Pavement Marking	STA
643.0015.____	Flagging	HR
643.0016.____	Pilot Car	HR
643.0017.____	Street Sweeping	HR
643.0018.____	Watering	MGAL
643.0019.____	Lane Closure	HR
643.0020.____	Detour	Day
643.0021.____	Road Closure	Day
643.0022.____	One Lane Road	HR
643.0023.____	Traffic Price Adjustment	CS
643.0024.____	Portable Changeable Message Board Sign	Day
643.0025.____	Traffic Control	CS
643.0026.____	Temporary Sidewalk Surfacing	SY
643.0027.____	Temporary Guardrail	LF
643.0030.____	Portable Steel Barrier	LF
643.0031.____	Interim Pavement Marking	LS
643.0032.____	Flagging	CS
643.0033.____	Detour	LS

CR643-010120

SECTION 644
SERVICES TO BE FURNISHED BY THE CONTRACTOR

Special Provisions

Replace Subsection 644-2.01 with the following:

644-2.01 FIELD OFFICE. Furnish and maintain a suitable office for the Engineer, available for occupancy from 2 weeks before beginning work, through 30 days after issuance of the notice of project completion as defined in Subsection 105-1.15. The following office requirements shall be met:

1. A minimum of 1000 square feet of floor area. The office area shall be divided so that it contains an office room separated by a closable door. The office room shall have a minimum of 160 square feet of floor area.
2. A thermostatically controlled interior heating system with necessary fuel.
3. Adequate electrical lighting and 120 volt, 60 hertz power, with a minimum of 6 electrical outlets.
4. A minimum of 100 square feet of window area and adequate ventilation.
5. Adequate parking for a minimum of 16 vehicles, with one handicap parking space meeting the requirements of Americans with Disabilities Act Accessibility Guidelines (ADAAG).
6. Attached indoor plumbing with sanitary lavatory facilities and potable drinking water provided.
7. Provide engineering communication services to the field office, Subsection 644-2.08.
8. If a part of the Contractor's building, it shall be completely partitioned off from the balance of the structure and provided with a separate outside door equipped with a lock.
9. Located within 3 miles of the project.
10. Weekly janitorial service consisting of emptying trash receptacles, vacuuming office area, and cleaning restrooms and counter areas.
11. Provide one mobilization and one demobilization of the Engineer's office equipment and furniture.

CR644.FOCOM-010120

644-2.02 FIELD LABORATORY. Replace 2.g. with the following:

g. 500 gallon capacity tank with a pressure pump or a commercial pressurized system.

Replace Subsection 2.h.(2) and (3) with the following:

(2) Wiring system to support a 100-amp user load demand with one 50-amp and two 20-amp circuits, all GFI protected.
(3) Outlets, ten conveniently spaced around the lab, 20-amp capacity, with no more than five outlets per circuit, and consistent with local codes.

Add 2.h.(6):

(6) Outside outlet, 220-volt.

Replace Subsection 4.c.(3) with the following:

Wiring system with each circuit GFI protected to satisfy a 60-amp user load demand. Provide three 20-amp circuits each with a 20-amp outlet. Space the outlets around the shed for the users convenience.

Replace 6.a. with the following:

a. Supply 240 volt, 60 hertz power, a 100 pound propane bottle, and a 500 gallon capacity water tank with a pressure pump or a commercial pressurized system for a State provided portable asphalt lab at a location designated by the Engineer.

Add the following:

7. Provide one mobilization and one demobilization of the Engineer's laboratory equipment from Anchorage.

CR644.LAB-010120

644-2.05 VEHICLES. Replace the second and third paragraphs with the following:

Pickup(LT)/Sport Utility Vehicle (SUV): Furnish full-size, four-wheel drive vehicles, either pickup/light truck(s) with crew cabs or sport utility vehicle(s). Provide vehicles less than three model years old, in good condition, and with less than 36,000 miles on the odometer. Furnish all fuels, maintenance and parts, and insurance during the Department's operation and use.

Equip each vehicle with lightbars wired into the vehicle's electrical system with a dash mounted switch easily accessible to the vehicle operator. Provide Code 3; Model 6005H (formerly PE 6200 LE) lightbars, or approved equal. Approved equal equipment shall have the following characteristics:

- (4) 55 watt rotators with amber filters
- 1200 flashes per minute
- (2) diamond mirrors
- 55 inches in length

If you are working after October 1, provide four studded snow tires mounted on each vehicle.

You are responsible for normal wear and tear, and any other incidental damage including broken windshields, occurring during the Department's operation and use. The Department is responsible for damage to any vehicle caused by its own negligent operation.

CR644.LTSUV-022015R

Add the following Subsection 644-2.08 Engineering Communication:

644-2.08 ENGINEERING COMMUNICATION. Engineering Communications, minimum service includes:

a. Three phone/facsimile lines and commercial phones (different phone numbers for each line)

   (1) One phone with built-in digital answering machine.
   (2) Ancillary equipment for operational service and as required by the Engineer.

b. High speed internet service with modem (DSL or Cable)

   (1) Send and receive capability supporting 1.0 Mbps download speed or higher and 0.5 Mbps upload speed at all times.
   (2) Data usage, 10 GB minimum monthly.
   (3) Wireless router.
   (4) Battery backup.
   (5) Ancillary equipment for operational service and as required by the Engineer.

CR644.FOCOM-010120

644-4.01 METHOD OF MEASUREMENT. Replace the third paragraph with following:

Vehicle (LT/SUV). For each vehicle provided. If a replacement vehicle is necessary, no additional measurement will be made.

CR644.LTSUV-022015R

644-5.01 BASIS OF PAYMENT. Add the following:

Electricity, propane, and water supplied for the State provided portable asphalt lab will not be paid for separately, but will be subsidiary to Pay Item 644.0002.____ Field Laboratory.

CR644.LAB-010120

Add the following:

Pay Item 644.2004.____ Engineering Communications.:

Usage services including long distance calls made by State personnel and the Internet service provider will be reimbursed by the State. Payment for communication usage services shall be based on paid receipts to the service provider plus 15%.

Connection fees (initial connection) local calls, providing equipment and disconnection are subsidiary to Pay Item 644.0001.____ Field Office and as such are paid by the Contractor.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
644.2004.____	Engineering Communications	CS

CR644.FOCOM-010120

Add the following:

Pay Item 644.2007.____ Vehicle (LT/SUV):

1. A percentage of the Contract unit price, to be determined by the Engineer, will be paid as full compensation for furnishing the vehicle at the site.

2. The balance of the Contract unit price will be prorated over the anticipated active construction period with a portion included as part of each interim payment, for maintenance, repairs, and fuel and, at the end of the project, for removing it from the site. If anticipated construction period changes, the final increment will be held until final payment.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
644.2007.____	Vehicle (LT/SUV)	Each

CR644.LTSUV-022015R

Special Provision

Add the following Section:

SECTION 645
TRAINING PROGRAM

645-1.01 DESCRIPTION. This Statewide Special Provision for on-the-job training (OJT) implements 23 CFR 230, Subpart A, Appendix B.

As part of the Equal Employment Opportunity Affirmative Action Program, the Contractor shall provide on-the-job training aimed at developing full journey status in the type of trade or job classification involved. The number of individuals to be trained and the number of hours of training to be provided under this contract will be as shown on the bid schedule.

645-2.01 OBJECTIVE. Training and upgrading of minorities and women toward journey status is the primary objective of this program. The Contractor shall enroll minorities and/or women, where possible, and document good faith efforts prior to the hire of non-minority males in order to demonstrate compliance with this Training Special Provision. Specific good faith efforts required under this Section for the recruitment and employment of minorities and women are found in the Federal EEO Bid Conditions, Form 25A-301.

645-3.01 GENERAL. The Contractor shall determine the distribution of the required number of apprentices/trainees and the required number of hours of training among the various work classifications based upon the type of work to be performed, the size of the workforce in each trade or job classification, and the shortage of minority and female journey workers within a reasonable area of recruitment.

Training will be provided in the skilled construction crafts unless the Contractor can establish prior to contract award that training in the skilled classifications is not possible on a project; if so, the Department may then approve training either in lower level management positions such as office engineers, estimators, and timekeepers, where the training is oriented toward construction applications, or in the unskilled classifications, provided that significant and meaningful training can be provided. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Credit for offsite training hours indicated above may only be made to the Contractor where the apprentices/trainees are concurrently employed on the project and the Contractor does one or more of the following: contributes to the cost of the training, provides the instruction to the apprentice/trainee, or pays the apprentice's/trainee's wages during the offsite training period.

Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

Prior to award of the contract, the Contractor shall submit Form 25A-311, Training Utilization Report, indicating the training program to be used, the number of apprentices/trainees to be trained in each selected classification, the number of hours of training to be provided, and the anticipated starting time for training in each of the classifications.

Training must begin within 2 weeks of the anticipated start date(s); unless otherwise authorized by a Directive. Such authorization will be made only after submission of documentation by the Contractor, and approval by the Engineer, of efforts made in good faith which substantiate the necessity for a change.

Contractors may use a training program approved by the U.S. Department of Labor, Office of Apprenticeship (USDOL/OA); or one developed by the Contractor using Form 25A-310 and approved prior to contract award by the OJT Coordinator in the DOT&PF Civil Rights Office.

The minimum length and type of training for each classification will be established in the training program selected by the Contractor. Training program approval by the Department for use under this section is on a project by project basis.

It is expected that each apprentice/trainee will begin training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist or until training has been completed. It is not required that apprentices/trainees be continuously employed for the duration of the contract.

If, in the judgment of the Contractor, an apprentice/trainee becomes proficient enough to qualify as a journey worker before the end of the prescribed training period and the Contractor employs that individual as a journey worker in that classification for as long as work in that area remains, the individual's training program will be considered completed and the balance of training hours required for that apprentice/trainee shall be waived.

The Contractor shall furnish each ADOT&PF training program trainee a copy of the program (Form 25A-310) to be followed during training on the project, and with a written certification showing the type and length of training completed on the project. Existing USDOL/OA apprentices should already have a copy of their program. No employee shall be employed for credit as an apprentice/trainee in a classification in which that employee has previously worked at journey status or has previously completed a training course leading to journey status.

The Contractor shall periodically review the training and promotion potential of minority and women employees and shall encourage eligible employees to apply for such training and promotion.

The Contractor shall provide for the maintenance of records and the furnishing of periodic reports documenting the progress of each apprentice/trainee. The Contractor must submit Form 25A-313 by the 15th of each month and provide each ADOT&PF trainee written evaluation reports for each unit of training provided as established on Form 25A-310.

645-3.02 WAGES. Trainees in ADOT&PF approved training programs will be paid prevailing Davis-Bacon fringe benefits plus at least 60 (but less than 100) percent of the appropriate minimum journey rate specified in the contract for the first half of the training period, at least 75 (but less than 100) percent for the third quarter of the training period, and at least 90 (but less than 100) percent for the last quarter of the training period. Trainee wages shall be identified on Form 25A-310. Apprentices in USDOL/OA training programs shall be paid in accordance with their approved program. Beginning wages of each trainee/apprentice enrolled in a Section 645 Training Program on the project shall be identified on Form 25A-312.

645-3.03 SUBCONTRACTS. In the event the Contractor subcontracts a portion of the work, he shall determine how many, if any, of the apprentices/trainees are to be trained by the subcontractor. Any such subcontracts shall include this Section 645, Form 25A-311 and Form 25A-310, where appropriate. However, the responsibility for meeting these training requirements remains with the Contractor; compliance or non-compliance with these provisions rests with the Contractor and sanctions and/or damages, if any, shall be applied to the Contractor in accordance with subsection 645-5.01, Basis of Payment.

645-4.01 METHOD OF MEASUREMENT. The Contractor will be credited for each approved apprentice/trainee employed on the project and reimbursed on the basis of hours worked, as listed in the certified payrolls. There shall be no credit for training provided under this section prior to the Contractor's submittal and approval by the Engineer of Form 25A-312 for each apprentice/trainee trained under this Section. Upon completion of each individual training program, no further measurement for payment shall be made.

645-5.01 BASIS OF PAYMENT. Payment will be made at the contract unit price for each hour of training credited. Where a trainee or apprentice, at the discretion of the Contractor, graduates early and is employed as a journey worker in accordance with the provisions of Subsection 645-3.01, the Contractor will receive payment only for those hours of training actually provided.

This payment will be made regardless of any other training program funds the Contractor may receive, unless such other funding sources specifically prohibit the Contractor from receiving other reimbursement.

Payment for training in excess of the number of hours specified on the approved Form 25A-311 may be made only when approved by the Engineer through Change Order.

Non-compliance with these specifications shall result in the withholding of progress payments until good faith efforts documentation has been submitted and acceptable remedial action has been taken.

Payment will be at the end of the project following the completion of all training programs approved for the project. No payment or partial payment will be made to the Contractor if he fails to do any of the following and where such failure indicates a lack of good faith in meeting these requirements:

1. provide the required hours of training (as shown in the Bid Schedule and approved Form 25A-311),

2. train the required number of trainees/apprentices in each training program (as shown in the Bid Schedule and approved Form 25A-311), or

3. hire the apprentice/trainee as a journey worker in that classification upon completion of the training program for as long as work in that area remains.

Failure to provide the required training damages the effectiveness and integrity of this affirmative action program and thwarts the Department's federal mandate to bring women and minorities into the construction industry. Although precise damages to the program are impractical to calculate, they are at a minimum, equivalent to the loss to the individuals who were the intended beneficiaries of the program. Therefore, where the Contractor has failed, by the end of the project, to provide the required number of hours of training and has failed to submit acceptable good faith efforts documentation which establishes why he was unable to do so, the Contractor will be assessed an amount equal to the following damages to be deducted from the final progress payment:

Number of hours of training not provided, times the journey worker hourly scale plus benefits. The journey worker scale is that for the classification identified in the approved programs.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
645.0001.____	Training Program, __ Trainees/Apprentices	LH

SSP-39-010116R

SECTION 646
CPM SCHEDULING

Special Provisions

Replace Subsection 646-2.01 with the following:

646-2.01 SUBMITTAL OF SCHEDULE.

Submit a detailed initial CPM Schedule at the preconstruction conference for the Engineer's acceptance as set forth below.

The construction schedule for the entire Project shall not exceed the specified contract time. Allow the Engineer 14 days to review the initial CPM Schedule. Revise promptly. The finalized CPM Schedule must be completed and accepted before beginning work on the Project.

646-3.01 REQUIREMENTS AND USE OF SCHEDULE. Delete No. 2.

2. 60-Day Preliminary Schedule.

Replace the first sentence of No. 3 Schedule Updates. with the following:

Hold job site progress meetings with the Engineer for the purpose of updating the CPM Schedule. Meet with the Engineer monthly or as deemed necessary by the Engineer.

CR646.1-070214R

Special Provisions

Add the following Section:

SECTION 647
EQUIPMENT RENTAL

647-1.01 DESCRIPTION. This item consists of furnishing construction equipment, operated, fueled, and maintained, on a rental basis for use in construction of extra or unanticipated work at the direction of the Engineer. Construction equipment is defined as that equipment actually used for performing the items of work specified and shall not include support equipment such as, but not limited to, hand tools, power tools, electric power generators, welders, small air compressors and other shop equipment needed for maintenance of the construction equipment.

The work is to be accomplished under the direction of the Engineer, and the Contractor's operations shall at all times be in accordance with the Engineer's instructions. These instructions by the Engineer shall be to the Contractor's supervisory personnel only, not to the operators or laborers. In no case shall these instructions by the Engineer be construed as making the Department liable for the Contractor's responsibility to prosecute the work in the safest and most expeditious manner.

647-2.01 EQUIPMENT FURNISHED. In the performance of this work, the Contractor shall furnish, operate, maintain, service, and repair equipment of the numbers, kinds, sizes, and capacities set forth on the Bid Schedule or as directed by the Engineer. The operation of equipment shall be by skilled, experienced operators familiar with the equipment.

The kinds, sizes, capacities, and other requirements set forth shall be understood to be minimum requirements. The number of pieces of equipment to be furnished and used shall be, as the Engineer considers necessary for economical and expeditious performance of the work. The equipment shall be used only at such times and places as the Engineer may direct.

Equipment shall be in first class working condition and capable of full output and production. The minimum ratings of various types of equipment shall be as manufactured and based on manufacturer's specifications. Alterations will not be considered acceptable in achieving the minimum rating. Equipment shall be replaced at any time when, in the opinion of the Engineer, their condition is below that normal for efficient output and production.

Equipment shall be fully operated, which shall be understood to include the operators, oilers, tenders, fuel, oil, air hose, lubrication, repairs, maintenance, insurance, and incidental items and expenses.

647-2.02 EQUIPMENT OPERATORS AND SUPERVISION PERSONNEL. Equipment operators shall be competent and experienced and shall be capable of operating the equipment to its capacity. Personnel furnished by the Contractor shall be, and shall remain during the work hereunder, employees solely of the Contractor.

The Contractor shall furnish, without direct compensation, a job superintendent or Contractor's representative together with such other personnel as are needed for Union, State, or Federal requirements and in servicing, maintaining, repairing and caring for the equipment, tools, supplies, and materials provided by the Contractor and involved in the performance of the work. Also, the Contractor shall furnish, without direct compensation, such transportation as may be appropriate for the personnel.

647-3.01 CONSTRUCTION REQUIREMENTS. The performance of the work shall be according to the instructions of the Engineer, and with recognized standards and efficient methods.

The Contractor shall furnish equipment, tools, labor, and materials in the kinds, number, and at times directed by the Engineer and shall begin, continue, and stop any of the several operations involved in the work only as directed by the Engineer.

Normally, the work is to be done when weather conditions are reasonably favorable, 6 days per week, Mondays through Saturdays, except holidays.

The Engineer will begin recording time for payment each shift when the equipment begins work on the project. The serial number and brief description of each item of equipment listing in the bid schedule and the number of hours, or fractions thereof to the nearest one quarter hour, during which equipment is actively engaged in construction of the project shall be recorded by the Engineer. Each day's activity will be recorded on a separate sheet or sheets, which shall be verified and signed by the Contractor's representative at the end of each shift, and a copy will be provided to the Contractor's representative.

647-4.01 METHOD OF MEASUREMENT. Section 109.

Hourly Rental Rate: Includes the equipment rate plus the operating costs including: furnishing, travel time, operating, maintaining/servicing and repairing the equipment along with the costs incidental to the equipment and its' operation.

647-5.01 BASIS OF PAYMENT. Payment is for the time that fully operational equipment is engaged in the performance of the work directed by the Engineer. Time not payed for includes: idle periods, maintaining/servicing and repairing the equipment, making change-overs of equipment parts, and time to travel to and from the project. Payment will only be for time supported by certified payroll.

Furnishing and operating equipment that is heavier, has larger capacity, or greater power than specified will not entitle the Contractor to extra compensation.

Pay Item 647.2000.____ Wide Pad Dozer, 65-HP Minimum: payed at the rate of $0/hour.

Pay Item 647.2002.____ Backhoe, 4WD, 1 CY Bucket, 75-HP Minimum, 15 ft Depth: payed at the rate of $0/hour.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
647.2000.____	Wide Pad Dozer, 65-HP Minimum	CS
647.2002.____	Backhoe, 4WD, 1 CY Bucket, 75-HP Minimum, 15 ft Depth	CS

CR647-110316R

Special Provision

Replace Section 651 with the following:

SECTION 651
CONTROL OF WORK – SUPPLEMENTAL REQUIREMENTS

651-1.01 DESCRIPTION. Supplemental requirements for Section 105, Control of Work.

651-1.02 RELATED SECTIONS. Section 105, Control of Work

651-1.03 UTILITIES. Request locates from the utilities having facilities in the area.

Use the Alaska Digline, Inc. "Locate Call Center" for the following utilities.

ALASKA DIGLINE, INC.	
Locate Call Centers:	
Anchorage	278-3121
Statewide	(800) 478-3121

State Facility Utilities: before beginning work, contact the Central Region Maintenance & Operations Office at (907) 269-0760 to obtain the District Superintendent's phone number where the project is located, and request locates.

651-1.04 COOPERATION BETWEEN CONTRACTORS. The following state owned projects may be under construction concurrently with this project.

Project Name:	Project No.:

Coordinate traffic control, construction, and material hauling operations with the prime contractor of the above projects to minimize impact on the traveling public, and to minimize conflicts with the work being

CR651-020118R

Special Provisions

Replace Section 652 with the following:

SECTION 652
PROSECUTION AND PROGRESS – SUPPLEMENTAL REQUIREMENTS

652-1.01 DESCRIPTION. Supplemental requirements for Section 108. Prosecution and Progress.

652-1.02 RELATED SECTIONS. Section 108, Prosecution and Progress.

652-1.04 LIMITATION OF OPERATIONS. In Subsection 108-1.04:

- Add: "Limit ground disturbed by construction activities and not permanently stabilized between all roadways combined, at any specific time, to a maximum of 11,000 feet parallel to the roadway(s), unless additional length is approved. Stabilize disturbed ground according to Section 641 Erosion, Sediment, and Pollution Control."

CR652-071519

Special Provision

Add the following Section:

Edit to the permit requirements.

SECTION 654
MONITOR

654-1.01 DESCRIPTION. When authorized by directive, engage a Professional Service Contractor to monitor eagle(s) at their nests.

654-1.02 SUBMITTAL.

1. Eagle Monitoring Plan and documentation as required by the monitoring plan.

2. Professional Service Contractor resume(s).

654-1.03 QUALIFICATIONS. Each position is required to be an employee of the Professional Service Contractor.

Professional Service Contract Manager.

1. Bachelor of Science degree in biology, environmental science, or ecology and working in the field of the degree, or

2. Two years of experience monitoring or studying the habitat of birds of prey.

Monitor.

1. Professional Service Contract Manager or a person trained and supervised by the Professional Service Contract Manager or other similarly qualified representative.

654-2.01 MATERIALS.

Video Camera	Optical zoom lens, minimum 10 power

654-3.01 CONSTRUCTION REQUIREMENTS.

Before beginning construction activity in the restricted area(s) specified in the directive, submit and receive approval for the following:

1. The qualifications of the Professional Service Contract Manager and Monitor.

2. An Eagle Monitoring Plan prepared by the Professional Service Contract Manager coordinated with the Contractors' Work Plan for work in the restricted area or any timing restricted period.

During Construction, submit and receive approval for the following:

1. Eagle monitoring documentation, reports, forms, video as required by the approved Eagle Monitoring Plan and included in the authorizing directive.

Refer to Section 107-1.11 Eagles for further information.

654-4.01 METHOD OF MEASUREMENT. Eagle monitoring measured as specified in the authorizing directive.

654-5.01 BASIS OF PAYMENT. Eagle monitoring work specified in the authorizing directive.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
654.2002.____	Eagle Monitoring	CS

CR654-100117R

SECTION 670
TRAFFIC MARKINGS

Special Provisions

670-1.01 DESCRIPTION. Add the following:

Furnish, locate and install Pavement Markings as shown on the Plans and as directed.

Pavement Marking Type: Methyl Methacrylate (MMA)

670-2.01 MATERIALS. Replace the material reference,

"Methyl Methacrylate Markings	Subsection 712-2.17", with,
Methyl Methacrylate Pavement Markings	Subsection 712-2.17

Add the following:

Methyl Methacrylate Pavement Markings are a combination of methyl methacrylate, glass beads and anti-skid aggregate.

Replace the last sentence with the following:

Submit a single certification from the manufacturer of the marking material, for each material combination, certifying the combination of marking material, glass beads and anti-skid aggregate, as furnished, provides the durability, retroreflectivity, and skid resistance specified.

670-3.01 CONSTRUCTION REQUIREMENTS. Replace No. 4 with the following:

4. Methyl Methacrylate Pavement Markings (MMA).

   a. General. 15 days before starting work meet with the Engineer for a prestriping meeting. At this meeting, do the following:
      (1) Furnish a striping schedule showing areas and timing of work, placing materials and the Traffic Control Plans to be used.
      (2) Discuss placement of materials, potential problems.
      (3) Discuss work plan at off ramps, on ramps and intersections.
      (4) Discuss material handling procedures.
      (5) Provide copies of the manufacturer's installation instructions and copies of the Material Safety Data Sheets.

   b. Manufacturer's Representative. Provide the services of a manufacturer's representative (the "Manufacturer's Representative"). Ensure the Manufacturer's Representative observes the application of the pavement marking materials. Cooperate with the Manufacturer's Representative and the Engineer to ensure that the materials are placed according to these Specifications and the manufacturer's recommended procedures.

   c. Manufacturer Certified Installers. Install pavement markings using only striping installers certified by the marking materials manufacturer for the specific striping material and method. Submit these certifications to the Engineer at the Preconstruction Conference.

   d. Preparation. Prepare the roadway surface to receive pavement markings according to these Specifications and the manufacturer's recommendations. Clean and dry the roadway surface. Completely remove contaminants such as dirt, loose asphalt, curing agents, surface oils, or existing road marking materials before applying pavement marking material.

e. Equipment.

(1) Grooving Equipment.
Use grooving equipment that produces a dry cut. Use vacuum shrouded equipment or other equally effective containment procedures.

(2) Marking Equipment.
(a) Longitudinal Marking: Use truck mounted application equipment capable of installing a double centerline and a single shoulder line in a single pass. Use automatic bead applicators that place a uniform layer of beads on the lines. Hand units are not permitted.
(b) Other Markings: Use manual or automatic application equipment. Use stencils or extruders to form sharply defined markings.

f. Application. Apply marking material according to these Specifications and the manufacturer's recommendations. Use equipment designed and capable of properly mixing at the place and time of application and approved by the manufacturer for the type of product being installed.

Anti-skid Aggregate. During marking material application, anti-skid aggregate will be evenly distributed and visible throughout the top 20 mils of the marking material mixture, and after the application, in the surface of the cured material.

SURFACE APPLIED

Marking thickness will be measured from the pavement surface.

(1) Longitudinal Markings. Apply markings for lane lines, edge lines, and centerlines to yield a thickness of 60 mils.

(2) Other Markings.
(a) Transverse and Symbol Markings:
Apply marking for symbols, arrows, stop bars, railroad symbols, and cross walks to yield a thickness of 60 mils.
(b) Gore Markings:
Apply diagonal gore markings to yield a thickness of 60 mils.

INLAID

Groove the area(s) designated in the Plans. Install markings in the same work shift as the grooving operation. Markings will be measured flush with the pavement surface.

(1) Longitudinal Markings. Groove the pavement to a depth of 250 mils. Apply markings for lane lines, edge lines, and centerlines to yield a thickness of 250 mils.

(2) Other Markings.
(a) Transverse and Symbol Markings:
Groove the area for inlaid markings to a depth of 250 mils. Apply marking for symbols, arrows, stop bars, railroad symbols, and cross walks to yield a thickness of 250 mils.
(b) Roundabouts:
As designated on the plans, groove the area for inlaid markings in roundabouts to a depth of 500 mils. Apply markings to yield a thickness of 500 mils.
(c) Gore Markings:
Diagonal gore markings will not be inlaid unless shown in the Plans.

g. Disposal of Waste. Waste material(s) are the Contractor's property. This includes grindings and removed marking material. Do not dispose of or store waste material(s) on State property. Dispose of waste material(s) according to applicable Federal, State, and local regulations.

h. Sampling. On the form provided by the Engineer, record the following readings and locations where they were taken using project stationing, and submit them to the Engineer with 24 hours for evaluation. Thickness of material and depth of slot are measured from the surface of the pavement.

SURFACE APPLIED

(1) For surface applied longitudinal applications, measure the thickness of the lines (above the pavement surface) at the time of application, every 500 feet.

(2) For surface applied other markings measure the thickness in three locations for each marking.

INLAID

(1) For inlay longitudinal applications, record the depth of the slot every 500 feet during the grinding operation.

(2) For inlay other markings measure the thickness in three locations for each marking.

Inspect the markings initially, and again two weeks after placement, to ensure the material has cured properly. Remove soft spots or abnormally darkened areas and replace with material meeting specifications.

The Engineer may elect to use the Contractor's readings or perform additional sampling.

Add the following:

Refer to the Survey Field Books identifying the no passing zones (see Subsection 642-3.01)

670-3.04 PAVEMENT MARKING REMOVAL. Add the following:

Coordinate removal work with construction activity. Remove pavement markings the same day permanent markings are applied, unless otherwise directed. Use vacuum shrouded equipment or other equally effective containment procedures.

Replace Subsection 670-3.06 with the following:

670-3.06 TOLERANCE FOR LANE STRIPING.

1. Length of Stripe. ± 2 inches.
2. Width of Stripe. ± 1/8 inch.
3. Lane Width. ± 4 inches from the width shown on the Plans.
4. Stripes on Tangent. Do not vary more than 1 inch laterally within a distance of 100 feet when using the edge of the stripe as a reference.
5. Stripes on Curves. Uniform in alignment with no apparent deviations from the true curvature.
6. All Stripes. Keep the center of the stripe within planned alignment.
7. Double Stripes. ± 1/4 inch.
8. Thickness of Surface Applied. Minimum specified to a maximum of + 30 mils.
9. Depth of Inlay Slot. Minimum specified to a maximum of + 40 mils.
10. Thickness of Inlaid Marking Material. Fill inlay area completely from the bottom of the inlay to the surface of the pavement.

If it is determined that the material is being placed too thin, the beads are not properly placed, the anti-skid aggregate is not visible, or otherwise not to specification, make immediate adjustments to correct the problem.

Pavement markings applied by any method will be unacceptable if:

1. Marking is not straight or wide enough.
2. Thickness of line is not uniform.
3. Thickness of line is less than specified.
4. Material is uncured.
5. Material blackens or is inconsistent in color.
6. Inlay slot is not the specified depth.
7. Inlay slot is not filled to the specified depth.
8. Edge of the markings is not clear cut and free of overspray.
9. Reflective elements are not properly embedded.
10. Retroreflectivity of the markings is less than specified.
11. Anti-skid aggregate is not visible in the marking material during application and the dried surface.
12. Markings exhibit poor adhesion.
13. Color is not as specified.

Perform repairs using equipment similar to the equipment initially used to place the materials. Do not perform repairs in a “patch work” manner. If more than one repair is required in a single 500 foot section, grind and repair the entire section.

670-4.01 METHOD OF MEASUREMENT. Add the following:

Thickness will be measured from the top of the marking to the top of the pavement surface. Marking material placed in a depression left by pavement line removal will not be included in measuring the thickness of the line.

Delete No. 2.

Replace No. 3 with the following:

3. Each. Pavement markings using letters, numbers, and arrows will be measured on a unit basis with each separate word or symbol constituting a unit. Railroad Markings will be measured by the complete unit shown for each lane of travel.

Replace No. 4 with the following:

4. Foot Basis. Longitudinal pavement markings, transverse, and gore markings, surface applied or inlaid will be measured by the linear foot of 4 inch wide line. Wider striping will be measured in multiples of 4 inches.

670-5.01 BASIS OF PAYMENT. Add the following:

For all phases of construction: There will be no separate payment for:

- Over-runs of material caused by the variation of the gradation of the asphalt
- Additional material required to achieve the thickness specified on open graded pavement

All work and materials associated with pavement markings are subsidiary to 670 items, including but not limited to:

- Milling for installation of the inlaid pavement markings including the removal of millings
- Temporary pavement markings and removal of conflicting markings, including repair of the roadway surface, milled surface or otherwise
- Traffic Control required for the installation of permanent and temporary pavement markings, removal of conflicting markings, and repairs

Add the following Pay Items:

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
670.2000____	MMA Pavement Markings	LS
670.2003.____	MMA Pavement Markings, Longitudinal Surface Applied	LF
670.2004.____	MMA Pavement Markings, Symbols and Arrow(s) Surface Applied	Each
670.2005.____	MMA Pavement Markings, Transverse and Gore Surface Applied	LF
670.2006.____	MMA Pavement Markings, Longitudinal Inlaid	LF
670.2007.____	MMA Pavement Markings, Symbols and Arrow(s) Inlaid	Each
670.2008.____	MMA Pavement Markings, Transverse and Gore Inlaid	LF

CR670.1-110812R

Special Provision

Add the following Section:

SECTION 682
UTILITY POTHOLING

682-1.01 DESCRIPTION. Expose subsurface utilities using a vacuum-extract truck. Record the location of the utility(s). Backfill the pothole and dispose of waste materials.

682-2.01 MATERIALS.

Backfill Material:	Aggregate Base Course, Grading D-1	Section 703
Asphalt Patch Material:	Hot Mix Asphalt Type II, Class B	Section 401

682-3.01 CONSTRUCTION. Submit the utility potholing schedule to the Engineer and utility companies not less than 7 days before starting potholing.

Deliver the vacuum-extract truck to the job-site with the debris tank empty.

Expose the subsurface utilities. Log the as-built information, subsection 682-3.02. Backfill the pothole immediately after the Engineer accepts the logged data. Backfill the first 6 inch lift using the excavated material, compact the material. Backfill the balance of the pothole using Aggregate Base Course, Grading D-1, compact the material. In paved areas, use Hot Mix Asphalt Type II, Class B to patch over the pothole, match the thickness of the surrounding pavement.

Dispose of excavations off-site. Before beginning potholing, provide to the Engineer a certificate, signed by the owner or owner's representative, identifying the disposal site and acceptance of the project potholing excavations.

Utilities damaged by the potholing operation require the Engineer to be immediately notified. The Contractor is responsible for the repairs and the associated costs. Contact and coordinate repairs with the utility owner.

682-3.02 AS-BUILTS. Create a utility pothole log, as-built, recording for each pothole: the date of potholing operation, utility type and size, station, offset, elevation, groundwater, and other pertinent data. Survey the utility location using the project horizontal and vertical control; comply with the requirements of Section 642. Submit the completed log to the Engineer within two working days following the completion of the pothole excavation.

682-4.01 METHOD OF MEASUREMENT. The pay unit, contingent sum, is measured by the hour of work performed.

682-5.01 BASIS OF PAYMENT. Pay Item No. 682.2000.____ is paid at $450/hour for the work to pothole; expose the utility(s), backfill the hole, patch disturbed pavement and dispose of excavations. The paid time includes the work; labor, and the fully operated vacuum truck or combination of vacuum truck and other Engineer approved equipment engaged in potholing at the area(s) identified in the Plans and/or identified by the Engineer. The paid time includes the time to empty the vacuum truck of excavation material, including the travel time, from this project only, to a certified disposal site.

Discuss project location relative to disposal sites with the Engineer. Include, modify or leave out the last sentence of the paragraph above.

Travel time to and from the project, idle time, maintenance and repairs (labor, material and time) are incidental and not included in the measured time.

As-built, utility pothole log, per subsection 682-3.02, will be paid under Section 642.

Potholes for the Contractor's information and potholes not accepted by the Engineer will not be paid for by the Department.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
682.2000.____	Vac-Truck Pothole	CS

CR682-010114R

Special Provision

Add the following Section:

SECTION 690
WATERWAY RESTORATION

690-1.01 DESCRIPTION. The work under this Section consists of performing all operations required to construct the realigned stream, simulated habitat, and wildlife crossing. This work shall include stream bank revegetation and protection techniques designed to reestablish a natural riparian zone and improve habitat for aquatic organisms. This work shall include temporary water diversion and roadway detour.

Construct and maintain temporary waterway (creek/stream/drainage) diversion and dewater work areas. Rewater waterway and remove temporary diversion.

Constructing detour shall include: excavation, installing and removing temporary pipes, temporary pipes, installing and removing lined channels, installing and removing temporary pavement, restoring disturbed areas, and other associated items.

Construction of the stream channel includes furnishing and installing vegetation, rock and stream substrate infill material to simulate a natural stream profile, grade control structures, and stream bed through culverts and in existing and reconstructed stream channels. Work includes developing, transporting, and storing materials; sediment control; placing bedding and fill to construct stream simulation channels inside and outside of structures; placing, keying, and compacting designed culvert infill material; reconstruction existing channels and banks; salvaging existing vegetative mat and placing it to restore habitat; and all other work to complete the project.

Location of work to be performed in shown in the Plans. Contractor is required to submit any changes to the Engineer in writing and receiving approval to proceed before implementing a modified plan.

The “Streambank Revegetation and Protection: A Guide for Alaska” manual published by the Alaskan Department of Fish and Game is available online at:
www.adfg.alaska.gov/index.cfm?adfg=streambankprotection.main

690-2.01 MATERIALS.

Vegetative Mat shall be salvaged from area within clearing and grubbing limits. It shall include surface vegetation, root mat, and organic soil and shall be a minimum of 1’ thick after placed in final location.

Woody debris shall have a bole diameter 6-12 inches, measured at breast height, and be a minimum of 8 feet in length with tree tops removed (or as directed in Plans).

Rock Features shall be a mix of Class II and Class III Riprap – with a diameter between 18 – 24 inches.

Stream substrate shall be a uniform mix of the following gradation.

Coarse Material (1 Part)		Fine Material (1 Part)	
Size	**% Passing**	**Size**	**% Passing**
18 inches	100	4 inches	100
15 inches	80–90	3 inches	75–85
9 inches	45–55	2 inches	65–75
6 inches	25–35	1 inch	45–55
4 inches	10–20	#4	25–35
4 inches	10–20	#10	20
		#40	15
		#200	10

Materials should conform to sections:

Materials shall conform to:
Aggregate
Riprap
Topsoil

CONSTRUCTION REQUIREMENTS

690-3.01 GENERAL

690-3.0X TEMPORARY WATER DIVERSION AND DEWATERING. Submit a plan for work area dewatering and each waterway diversion, 14 days before related construction activities. Do not implement the plan without written approval.

Comply with permit requirements. Additionally:

1. Do not exceed State of Alaska water quality standards.

2. Do not divert water from dewatering into waterway, except if the required permits are attained from, but not limited to, Alaska Department of Natural Resources, Alaska Department of Environmental Conservation, Corp of Engineers, and the U.S. Environmental Protection Agency.

3. Provide an approved disposal site for work area excess water.

4. Prevent turbid water from directly entering the waterway.

5. Discharge work site water a minimum of 100 ft. from waterway.

6. Do not divert water onto the roadway.

7. Complete diversion and dewatering activities during the fish window, _____ to _____.

8. Relocate fish contained inside the coffer/diversion dam areas before the site is dewatered. Relocate fish to the closest pool upstream of the construction area.

690-3.0X CONSTRUCTION
Excavate according to Section 203 Excavation and Embankment and Section 205 Excavation, Backfill, and Foundation Fill for Major Structures. Control excavated material to minimize disturbance to the adjacent channel and banks.

Construct creek pool, weir, riffle, thalweg, and stream banks as shown in the Plans, including the use of Ditch Lining, Class II Riprap, woody debris, rock features, stream substrates, topsoil, and vegetative mat.

Construct banks using larger pieces for key footer pieces at toe of riprap slope. Key and lock smaller materials of varying sizes to fill voids. Construct bank faces to be uneven, protrude into the channel, and be rough in appearance. Construct the top of the bank to be fairly uniform. Tie back constructed banks and margins at the edge of the structure walls into the existing stream banks at dimensions similar to those found in the field.

690-3.02 VEGETATIVE MAT.

Salvage and stockpile vegetative mat high in organics, including leaf litter and root mats, removed during grubbing.

Vegetative Mat shall be placed in one operation as much as practical to minimize handling and to keep root mat intact.

690-3.03 WOODY DEBRIS.

Woody debris shall be from coniferous trees. Push over trees, and only tree boles should be used, removing root fans. Collect woody debris from cleared area. Place in stream according to plans.

690-3.04 ROCK FEATURES.

Rock features shall be placed as directed by Engineer, at random interval, with 3-5 rock features placed in every wier/riffle/pool sequence. Embed features 25% into stream substrate or key underneath woody debris.

690-3.04 STREAM SUBSTRATE.

Stream substrate shall be a uniform mix of its gradation and placed according to the Plans.

690-3.0X REWATERING. Rewater to minimize sediment movement downstream of the site. Prior to rewatering, slowly wet the reconstructed waterway channel; wash the fines into the bed by using pumps, or by diverting a small portion of the waterway channel flow. Capture and pump the sediment and turbid water, from the downstream end of the channel to the upstream end of the channel, until fines washed into the streambed and water runs clear. Attain the Engineers written approval before breaching the coffer/diversion dams. Slowly breach the coffer/diversion dams and rewater the waterway channel.

690-4.01 METHOD OF MEASUREMENT.

690-5.01 BASIS OF PAYMENT.
Pay Item No. 690.2005.0000 is paid Lump Sum, all required labor, supervision, material, equipment, and incidentals to excavate, reconstruct creeks/stream and streambanks, place rocks, vegetative mat, and woody debris is included. Excavation, backfill, and disposal of all unsuitable and / or surplus material not covered under other pay items are subsidiary to pay item 690.2005.____ Waterway Restoration.

Constructing detour and temporary water diversion as part of the Waterway Restoration is incidental to item 690.2005.____ Waterway Restoration. This work may include but is not limited to diverting water, dewatering, excavation, installing and removing temporary pipes, temporary pipes, installing andremoving lined channels, installing and removing temporary pavement, restoring disturbed areas, and other associated items.

Recovering material for use as Vegetative Mat and woody debris is incidental to item 690.2005.____ Waterway Restoration. Placing vegetative mat will be paid for under item 690.2005.____ Waterway Restoration. Placing material for woody debris will be paid for under item 690.2005.____ Waterway Restoration.

Class II Riprap placed as part of the Waterway Restoration will not be measured separately but will be included in the measurement and payment of item 690.2005.____ Waterway Restoration.

Payment will be made under:

PAY ITEM

Item Number	Item Description	Unit
690.2005.____	Waterway Restoration	Lump Sum

DIVISION 700 — MATERIALS

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SECTION 701
HYDRAULIC CEMENT AND SUPPLEMENTARY CEMENTITIOUS MATERIALS

Section place holders. Keep or remove the place holder as required by the project. Remove the place holder content by (1) individually highlighting the content, including the page and section breaks, and then using the delete key or (2) in the navigation pane - select the section to be removed > right click the shaded section heading and select "delete" (this removes the Section, page and section breaks and all content in the section). Verify the headers and footers remain correct for the section before and after the deleted Section.

SECTION 702
ASPHALT MATERIALS

Special Provision

702-2.01 ASPHALT BINDER. Replace the 1st. paragraph with the following:

Meet AASHTO M 320 Performance-Graded Asphalt Binder and AASHTO M332 Performance-Graded Asphalt Binder Using MSCR Test Specification; except, as included in Table 702-2.01-1 Performance-Graded Asphalt Binder – Exceptions.

TABLE 702-2.01-1
PERFORMANCE-GRADED ASPHALT BINDER - EXCEPTIONS

Performance Grade	Viscosity AASHTO T 316	Multiple Stress Creep Recovery MSCR, AASHTO T 350			Dynamic Shear PAV, AASHTO T 315	Direct Tension AASHTO T 314	Elastic Recovery AASHTO T 301
		$J_{NR3.2}$ kPa^{-1}	J_{NR} Diff	% $Recovery_{3.2}$	G*Sinδ, kPa		
AASHTO M320 Performance-Graded Asphalt Binder							
PG 52-28	None	—	—	—	None	Delete	None
PG 52-40	None	—	—	—	None	Delete	None
PG 52-40 ER	None	—	—	—	None	Delete	50% min.
PG 58-34 ER	None	—	—	—	None	Delete	60% min.
PG 64-40 ER	None	—	—	—	None	Delete	60% min.
AASHTO M332 Performance-Graded Asphalt Binder Using MSCR Test Specification							
PG52-40 V	None	0.50 max.	Delete	75 min.	None	Delete	None
PG58-34 E	None	0.25 max.	Delete	85 min.	None	Delete	None
PG 64-40 E	1 Pa•s max.	0.10 max.	Delete	95 min.	5000 max. @ 4°C	Delete	None

CR702.3-100118R

SECTION 703
AGGREGATES

Special Provisions

Replace Subsection 703-2.04 with the following:

703-2.04 AGGREGATE FOR HOT MIX ASPHALT. Process and crush aggregate that is free from clay balls, organic matter, other deleterious material, and not coated with dirt or other finely divided mineral matter. Aggregate used must consist of sound, tough, durable rock of uniform quality.

Remove all natural fines passing a No. 4 sieve before crushing aggregates for Type IV, and V mixes.

Coarse Aggregate. Aggregate retained on the No. 4 Sieve.

Meet Table 703-3 requirements:

TABLE 703-3
COARSE AGGREGATE QUALITY FOR HMA

Description	Specification	Type II, Class A	Type I; Type II, Class B; Type III	Type IV	Type V
LA Wear, % max.	AASHTO T 96	45	45	45	45
Degradation Value, min.	ATM 313	30	30	30	30
Sodium Sulfate Loss, % max. (5 cycles)	AASHTO T 104	9	9	9	9
Fracture, % min.	ATM 305	90, 2 face	80, 1 face	90, 2 face	98, 2 face
Flat-Elongated Pieces, % max.	ATM 306				
1:5		8	8	8	8
Absorption, % max.	ATM 308	2.0	2.0	2.0	2.0
Nordic Abrasion, % max.	ATM 312	-	-	-	

a. Hard Aggregate that meets the Nordic Abrasion values specified may be obtained from, but not limited to, the following sources:

- MS 52-068-2, located at MP 217 on the Parks Highway near Cantwell
- Alaska Lime Co, Jim Caswell, located at MP 216.5 on the Parks Highway near Cantwell
- CalPortland plants located in Dupont Washington
- Jack Cewe Ltd located in Coquitlam British Columbia, Canada

Fine Aggregate. Aggregate passing the No. 4 sieve.

Aggregate shall meet the quality requirements of AASHTO M 29, including S1.1, Sulfate Soundness.

Aggregate for Type II, Class A mix shall not contain more than 10% natural fines (blend sand and mineral filler) added to the crushed aggregate, and shall not exhibit rut depth larger than 1/4-inch, as determined by ATM 419.

Fine aggregate for Type IV and V mixes:

- do not blend back natural sand
- shall be non-plastic as determined by ATM 205
- shall have a minimum uncompacted void content (Fine Aggregate Angularity) determined by AASHTO T 304, Method A, of 45%

TABLE 703-4
BROAD BAND GRADATIONS FOR HOT MIX ASPHALT AGGREGATE
Percent Passing by Weight

SIEVE	GRADATION				
	Type I	Type II	Type III	Type IV	Type V
1 inch	100	-	-	-	-
3/4 inch	80-90	100	-	-	100
1/2 inch	60-84	77-99	100	100	65-90
3/8 inch	48-78	68-88	80-90	80-95	55-80
No. 4	28-63	48-68	44-81	55-70	40-60
No. 8	14-55	33-53	26-70	35-50	≤ 45
No. 16	9-44	20-40	16-59	20-40	≤ 35
No. 30	6-34	14-30	9-49	15-30	≤ 25
No. 50	5-24	9-21	6-36	10-24	≤ 20
No. 100	4-16	6-16	4-22	5-15	≤ 12
No. 200	4-7	3-6	4-7	4-7	4-7

703-2.07 SELECTED MATERIAL.

Replace 1. Type A with the following:

1. Type A. Aggregate containing no muck, frozen material, roots, sod or other deleterious matter and with a plasticity index not greater than 6 as tested by ATM 204 and ATM 205. Meet the following gradation as tested by ATM 304:

Sieve	Percent Passing by Weight
No. 4	20-55%
No. 200	0-6%, determined on the minus 3-inch portion of the sample

703-2.13 STRUCTURAL FILL. Replace Table 703-12 with the following:

TABLE 703-12
AGGREGATE GRADATION FOR STRUCTURAL FILL

SIEVE	PERCENT PASSING BY WEIGHT
3-inch	100
3/4-inch	75-100
No. 4	20-55
No. 200	0-6

Replace Subsection 703-2.16 with the following:

703-2.16 RECYCLED ASPHALT PAVEMENT (RAP). RAP shall be free of contamination and deleterious materials. RAP maximum particle size shall not exceed 1.5-inch.

CR703.1-100117R

SECTION 704
MASONRY UNITS

Section place holders. Keep or remove the place holder as required by the project. Remove the place holder content by (1) individually highlighting the content, including the page and section breaks, and then using the delete key or (2) in the navigation pane - select the section to be removed > right click the shaded section heading and select "delete" (this removes the Section, page and section breaks and all content in the section). Verify the headers and footers remain correct for the section before and after the deleted Section.

SECTION 706
CONCRETE AND PLASTIC PIPE

Special Provisions

Replace Subsection 706-2.07 with the following:

706-2.07 CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE FOR CULVERTS, STORM DRAINS, AND UNDERDRAINS. Meet the following:

Corrugated Pipe and Fittings (non-pressurized)

AASHTO M 294 and 252	Type S

Perforations

2.07. Designer clearly identify the type of perforation required for the underdrain, storm and underdrain pipe in Section 605.

1. Underdrains	Class 2
2. Underdrains and Storm Drains	Class 1

Joints	Subsection 705-2.05.3.

Polyethylene Pipe Manufacturer

1. Participate in the National Transportation Product Evaluation Program (NTPEP) work plan for HDPE thermoplastic pipe and listed on the NTPEP audit website displaying NTPEP compliance.

2. Conduct and maintain a quality control program under the NTPEP.

3. Provide a manufacturer's certificate of compliance identifying production lots for all materials.

Provide corrugated polyethylene pipe and fittings manufactured from high-density polyethylene (HDPE) virgin compounds. May use clean, reworked polyethylene materials from the manufacturer's own production.

Do not install pipe that is more than two years from the date of manufacture.

CR706.1-050119

SECTION 710
FENCE AND GUARDRAIL

Special Provisions

Replace Subsection 710-2.04 with the following:

710-2.04 METAL BEAM RAIL.

1. W-Beam and Thrie Beam Guardrail. Meet AASHTO M 180, Class A, Type II. Galvanize after fabrication. Meet the coating requirements of AASHTO M 180 9, Type II Beams and AASHTO M 111 (ASTM A123) as referenced.

2. Box-Beams Guardrail. Meet:

   a. ASTM A500 Grade B, or
   b. ASTM A501.

   Galvanize after fabrication. Meet the coating requirements of AASHTO M 111 (ASTM A123).

CR710.3-020119

SECTION 712
MISCELLANEOUS

Special Provisions

712-2.17 METHYL METHACRYLATE PAVEMENT MARKINGS. Replace No. 1. Quality Requirements: with the following:

1. Quality Requirements: Use a marking material formulated for the application type specified. Use a marking material manufactured from new materials and free from dirt and other foreign material. Use a methyl methacrylate based resin system for part "A". Use benzoyl peroxide system for part "B".

   Extruded or stenciled application: Material formulated for extruded or direct stenciled application with factory intermix beads, and anti-skid aggregate and the application of additional surface applied beads.

   Submit a manufacturer certification for both the methyl methacrylate material, glass beads and anti-skid aggregate to ensure that the materials furnished conform to these Specifications.

4. Performance Properties: Add the following:

   k. Color: Yellow, PR-1 Chart, 33538 Federal Yellow. White, minimum daylight reflectance of 84.

Replace Subsection 712-2.18 with the following:

712-2.18 GLASS BEADS FOR METHYL METHACRYLATE PAVEMENT MARKINGS. Use the type and quantity of beads specified in writing by the marking material manufacturer required to satisfy the specified performance requirements. The written certification will note the bead coating is compatible with the marking material binder.

1. Bead Manufacturer and Type.

   a. Swarco, Megalux-Beads or
   b. Approved equal beads

   Approved Equal Beads. Equal beads will demonstrate:
   (1) Bead coatings compatible with marking materials. Marking Material Manufacturer will certify compatibility.
   (2) Lasting retro reflectivity.

CR712.1-010109R

SECTION 726
TOPSOIL

Special Provision

Replace Subsection 726-2.01 with the following:

726-2.01 TOPSOIL. Furnish topsoil that is representative of the existing, natural organic blanket of the project area, and free of prohibited and restricted noxious weeds (Prohibited and Restricted Noxious Weeds 11AAC 34.020 http://plants.alaska.gov/invasives/noxious-weeds.htm). Perform a quality test, as defined by ATM 203, on the soil to determine the organic content of the soil. Supply the results to the Engineer.

Soil with an organic content of 5 percent or more may be reused and spread on the finished slopes where topsoil is noted on the plans. Remove roots, stumps, unnatural material, and rocks greater than 3 inch in diameter from the organic material before it is graded onto the finished slope.

Soil with an organic content of less than 5 percent cannot be used as topsoil for the project. In this case furnish topsoil consisting of a natural friable surface soil without admixtures of undesirable subsoil, refuse or foreign materials having an organic content of 5 percent or more, as determined by ATM 203. The material shall be reasonably free from roots, clods, hard clay, rocks greater than 3 inches in diameter, noxious weeds, tall grass, brush, sticks, stubble or other litter, and shall be free draining and nontoxic. Notify the Engineer of the topsoil source location at least 30 calendar days before delivery of topsoil to the project from the identified location. The Engineer will inspect the topsoil and its sources before approval will be granted for its use.

TABLE 726-1
LIMESTONE REQUIREMENTS

Soil pH	Limestone, tons/acre
Above 6.0	0
5.0-6.0	1.5
Below 5.0	3.0

CR726.1-010120

Replace Section 727 with the following:

SECTION 727
SOIL STABILIZATION MATERIAL

727-2.00 GENERAL. Free of restricted and prohibited noxious weeds (11 AAC 34), seeds, chemical printing ink, germination and growth inhibitors, herbicide residue, chlorine bleach, (except where specified: rock, metal, plastics) and other deleterious materials and not harmful to plants, animals and aquatic life. Wood cellulose "paper" fiber, wood chips, sawdust, and hay are not permitted as stabilization materials.

727-2.01 MULCH. Flexible blanket/covering, temporary degradable (bio/photo) form of erosion control. Use one of the following:

Dry Erosion Control, Stabilization Products. Hand applied or spread with mulch blower equipment.

1. Straw. Use straw, in an air-dried condition, from oats, wheat, rye, or other approved grain crops that are free from noxious weeds, seeds, mold, or other materials detrimental to plant life. Straw material shall be certified weed-free straw using North American Weed Management Association (NAWMA) Standards. In-lieu of certified weed-free straw provide documentation that the material is steam or heat treated to kill seeds or provide U.S. or state's department of agriculture laboratory test reports, dated within 90 days prior to the date of application showing that there are no viable seeds in the straw.

2. Shredded Bark Mulch. Shredded bark and wood with the following characteristics:
   a. Not containing resin, tannin, or other compounds in quantities harmful to plant life.
   b. Maximum length of individual pieces is 2 inches with 75% passing through a 1 inch sieve.
   c. Will form a uniform ground cover/mat, have moisture absorption, retention, and percolation properties, not be susceptible to spreading by wind or rain providing a good growth medium.
   d. May contain up to 50% shredded wood material.
   e. Shredded wood material aged 1 year minimum prior to use.

Hydraulic Erosion Control Products (HECPs) Applied hydraulically.

A fiber mulch matrix: biodegradable and composed of wood, straw, coconut and other fibers natural and man-made. When applied, create a continuous, porous, absorbent high water holding, flexible blanket/mat/mulch/covering making intimate contact with, and adhering to sloped soil surface; permitting water infiltration; resists erosion and promotes rapid germination and accelerated plant growth. The fibers may be thermally processed, and cross-linked with a hydro-colloidal or linear anionic tackifier (curing period 24-48 hours) or mechanically-bonded (no curing period). When agitated in slurry tanks with water the fibers will become uniformly suspended, without clumping to form homogeneous slurry.

The HECPs shall be delivered premixed by the manufacturer. The HECP will contain only the materials provided in the sealed containers from the manufacturer. No added components are permitted after the manufacturer seals the product container, before application, during application or otherwise. Submit documentation dated within 3 years of application, from an independent accredited laboratory as approved by the Engineer, showing that the product's testing performance meets the requirements for the slope(s) to be protected on the project, according to the National Transportation Product Evaluation Program (NTPEP), Erosion Control Technology Council (ECTC) and or the Texas DOT/Texas Transportation Institute (TTI) Laboratory.

If the HECP contains cotton or straw provide documentation that the material is certified weed free using NAWMA Standards. In-lieu of certified weed-free straw, provide documentation that the material is steam or heat treated to kill seeds or provide U.S. or state's department of agriculture laboratory test reports, dated within 90 days prior to the date of application showing that there are no viable seeds in the straw.

The HECP shall contain a dye to facilitate placement and inspection of the material.

1. Wood Strand, Fiber.
   A blend of angular, loose, long thin wood pieces with a high length to width ratio and that are frayed. Minimum 95% of strands between 2 inches and 10 inches, at least 50% of the length shall have a width thickness between 1/16 and 1/8 inch. No single strand shall have a width or thickness greater than 1/2 inch. Processed wood fiber with the following characteristics:
   a. Will remain in uniform suspension in water under agitation and will blend with grass seed, fertilizer and other additives to form homogeneous slurry.
   b. Will form a blotter-like uniform ground cover on application, have moisture absorption, retention and percolation properties, the ability to cover, and hold grass seed in contact with soil, and not create a hard crust upon drying providing a good growth medium.

2. Dried Peat Moss. Partially decomposed fibrous or cellular stems and leaves of any of several species of Sphagnum mosses with the following characteristics:
   a. Chopped or shredded to allow distribution through normal hydraulic type seeding equipment and capable of being suspended in water to form part of a homogeneous slurry.
   b. Free from woody substances and mineral matter such as sulfur or iron and with a pH value of between 4.0 and 6.5.
   c. Furnished in an air dry condition and containing less than 35% moisture by weight. Have a water holding capacity of not less than 800% by weight on an oven dry basis.

3. Fiber Matrix (FM) Mulch - Types.
   a. Stabilized Mulch Matrices (SMMs)
   b. Bonded Fiber Matrices (BFMs)
   c. Mechanical Bonded Fiber Matrix (MBFM)
   d. Polymer Stabilized Fiber Matrix (PSFM)
   e. Fiber Reinforced Matrices (FRMs)
      - Flexible Growth Medium (FGM)
      - Extended-Term Flexible Growth Medium (ET-FGM)

727-2.02 MATTING. Fiber mulches, mulch matrices, nets and turf reinforcement mats manufactured from wood fibers, straw, jute, coir, polyolefins, PVC, nylon and others creating dimensionally stable nets, meshes, geotextiles and blankets; creating a continuous, porous, absorbent, flexible blanket/mat/mulch/covering making intimate contact with and adhering to sloped soil surface, resisting erosion and promoting rapid germination and accelerated plant growth.

Rolled Erosion Control Products (RECPs) (Temporary Degradable and Permanent Erosion Control)
Use RECPs that bear the Quality and Date Oversight and Review (QDOR) Seal from the ECTC. Independent test results from the NTPEP, that the mulch, when tested according to ASTM 6459 Standard Test Method for Determination of Rolled Erosion Control Products (RECP), Performance in Protecting Hillslopes from Rainfall-Induced Erosion, meets the performance requirement using the Revised Universal Soil Loss Equation (RUSL).

Functional Longevity.

1. Temporary Degradable.

   a. Duration.

      1) Short-Term RECPs. (RECPs 3 - 12 months)
         C_{Factor} = .15 maximum
         Test Soil Type = Sandy Loam
         (National Resources Conservation Service (NCRS) Soil Texture Triangle)

      2) Moderate (Extended) -Term RECPs. (RECPs 24 months)
         C_{Factor} = .05 maximum
         Test Soil Type = Sandy Loam (NCRS Soil Texture Triangle)

3) Long-Term RECPs. (RECPs 36 months)
C_{Factor} = .01 maximum
Test Soil Type = Sandy Loam (NCRS Soil Texture Triangle)

b. Product types.

1) Mulch-Control Nets (MCNs). Planar woven natural fiber or extruded geosynthetic mesh used to anchor loose fiber matting/mulches.

2) Erosion Control Blankets (ECBs). Processed natural and/or polymer fibers, yarns or twines mechanically, structurally, or chemically bound together to form a continuous matrix with a minimum weight of 8 oz/yd^2 and a limiting shear stress of 0.45 lb/ft^2.

3) Netless. Fibers mechanically interlocked and/or chemically adhered together.

4) Single-net and Double-net. Fibers mechanically bound together by single or double netting.

5) Open Weave Textiles (OWTs). Fibers woven into a continuous matrix.

c. Materials.

1) Burlap. Standard weave with a weight of 3.5 to 10 oz/yd^2.

2) Jute Mesh Fabric. Cloth of a uniform, open, plain weave of undyed and unbleached single jute yarn. Use yarn that is loosely twisted and not varying in thickness more than one-half its normal diameter. Furnish jute mesh in rolled strips meeting the following requirements:
   a) Width: 45 to 48 inches, ± 1 inch
   b) 78 warp-ends per width of cloth (minimum)
   c) 41 weft-ends per yard (minimum)
   d) Weight: 20 ounces per linear yard, ± 5%

3) Woven Paper or Sisal Mesh Netting. Woven from twisted yarns available in rolls 45 to 48 inches wide. Mesh may vary from closed to open weave, ranging from 1/8 to 1/4 inch openings. Shrinkage after wetting may not exceed 20% of the surface area.

4) Knitted Straw Mat. Commercially manufactured ECB. Use photodegradable netting and biodegradable thread. Use straw, in an air-dried condition, from oats, wheat, rye, or other approved grain crops that are free from noxious weeds, seeds, mold, or other materials detrimental to plant life. ECB may contain coconut or fiber to reinforce the straw. Straw material shall be certified weed-free straw using NAWMA Standards. In-lieu of certified weed-free straw, provide documentation that the material is steam or heat treated to kill seeds or provide U.S. or state's department of agriculture laboratory test reports, dated within 90 days prior to the date of application showing that there are no viable seeds in the straw.

5) Woven/Curled Wood blanket. Machine produced mat of curled wood shavings with a minimum of 80% 6-inch or longer fibers, with consistent thickness and the fibers evenly distributed over the entire area of the blanket. Smolder resistant without the use of chemical additives. Cover the top side of the blanket with biodegradable extruded plastic mesh.

6) Coconut (Coir Fiber). Machine produced mat, ECB of consistent thickness and coir fiber evenly distributed over the area of the mat. Use bio/photo degradable netting and thread.

2. Permanent.

    a. Product Types and Materials.

        1) Turf Reinforcement Mats (TRMs). A rolled erosion control product composed of non-degradable synthetic fibers, filaments, nets, wire mesh, and/or other elements, processed into a permanent, three-dimensional matrix of sufficient thickness with a minimum weight of 8 oz/yd^2 and a minimum limiting shear stress of 1.5 lb/ft^2. TRMs (may be supplemented with degradable components) shall impart immediate erosion protection, enhance vegetation establishment during and after maturation and permanent vegetation reinforcement providing long-term functionality.

727-2.03 SEDIMENT RETENTION FIBER ROLLS (SRFRs). Fiber rolls also referred to as wattles. Manufacture of photodegradable or biodegradable fabric netting without preservative treatment, evenly woven, free of crusted material, cuts, and tears. Manufacture stakes of photodegradable or biodegradable material (wood stakes, except as approved by the Engineer).

1. Filter Sock (Wattle)
    a. Fabric netting.
    b. Filled with wood fiber, straw, flax, rice, coconut fiber material.
    c. Minimum diameter 5 inches.

2. Compost Sock.
    a. Extra Heavy weight fabric netting with a minimum strand width of 5 mils.
    b. Filled with coarse compost.
    c. Minimum diameter 8 inches.

3. Coir Log.
    a. Woven wrap bristle coir twine netting.
    b. Filled with 100% coconut (coir) fiber uniformly compacted.
    c. Segments maximum length 20 foot, diameter as suited to the application and a density of 7 lbs/pcf or greater.
    d. Coir twine strength equal to 80 lb minimum weaved to a 2 inch x 2 inch opening pattern.
    e. Ties made of hemp rope by 1/4 inch diameter.

727-2.04 COMPOST. Suitable for serving as a soil amendment or an erosion control material. Sanitized, mature compost meeting local, state, and Federal quality requirements tested and certified by the U.S. Composting Council (USCC) under the Seal of Testing Assurance (STA) Program. Biosolids compost must meet the Standards for Class A biosolids outlined in 40 Code of Federal Regulations (CFR) Part 503. Additionally, meet the requirements of the AASHTO specifications:

1. Compost Blankets. Standard Practice for Compost for Erosion/Sediment Control (Compost Blankets) R 52.

2. Compost Filter Berms and Filter Socks. Standard Practice for Compost for Erosion/Sediment Control (Filter Berms and Filter socks) R 51.

727-2.05 TACKIFIER. Tackifier, viscous overspray, generally composed of dry powered vegetable gums derived from guar gum, psyllium and sodium alginase; asphaltic emulsions; petroleum distillates; co-polymer emulsions; and lignosulfonates and used to anchor soil, compost, seed, the mulch fibers to one another, and the ground. Contain no growth or germination inhibiting materials nor significantly reduce infiltration rates. Tackifier shall hydrate in water and readily blend with other slurry material. Tackifier options include:

1. Type A. Organic tackifier with certification of plant sources; or

2. Type B. Synthetic tackifier with certification confirming product is not harmful to plants, animals, or aquatic life.

727-2.06 POLYACRYLAMIDE (PAM). Use as a tie-down for soil, compost, seed and as a flocculent. Polyacrylamide (PAM) products shall meet the requirements of American National Standards Institute (ANSI)/National Sanitation Foundation International (NSF) Standard 60 for drinking water treatment, be anionic (not cationic), linear and not cross-linked with an average molecular weight greater than 5 Mg/mole, minimum 30 percent charge density; contain at least 80% active ingredients and a moisture content not exceeding 10% by weight.

Deliver PAM in a dry granular powder or liquid form.

727-2.07 GEOTEXTILE-ENCASED CHECK DAM AND SEDIMENT BARRIER. Urethane foam core encased in geotextile material (silt fence material Section 633), minimum 8 inches height by minimum base width of 16 inches by minimum 7 foot length. Overhang the geotextile 6 inch minimum each end with apron type ties by 24 inches each side of the foam core.

727-2.08 SANDBAG.

1. Sandbag Sack Fabric. Fabric shall be a nonwoven, needle punched design meeting the Minimum Average Roll Values (MARV) verified in accordance with ASTM D4759.

2. Seam Thread. Similar durability to the sandbag sack fabric.

3. Sandbag Fill Material.
   a. Selected Material 703-2.07 Type B

4. Cinch Ties. Plastic ties or equivalent tie recommended by the sandbag manufacturer.

727-2.09 MANUFACTURED INLET PROTECTION SYSTEM.

1. Manufacturers:
   a. Ultra Tech International – Ultra-DrainGuard
   b. Bowhead Environmental and Safety - StreamGuard Exert II Sediment Insert
   c. Enpac - Catch Basin Insert, Oil and Sediment or
   d. Approved equal.

727-2.10 CLEAR PLASTIC COVERING. A clear plastic covering meeting the requirements of the National Institute of Standards and Technology (NIST) voluntary Product Standard PS 17 - 69 for polyethylene sheeting having a minimum thickness of 6 mils.

727-2.11 STAPLES. U-shaped staples for anchoring matting, approximately 6 inches long and 1 inch wide. Machine-made: No. 11 gage or heavier steel wire. Hand-made: 12-inch lengths of No. 9 gage or heavier steel wire.

CR727-050812R

SECTION 730
SIGN MATERIALS

Special Provisions

730-2.04 SIGN POSTS.

Add No. 7:

7. Structural Tubing and W-Shape Beams.

   a. Structural tubing shall conform to ASTM A500, Grade B, or ASTM A501. The tubing shall be square and of the dimensions called for in the Plans with 0.2 inch thick walls. 0.4 inch diameter holes shall be drilled as required to permit mounting of the sign.

   b. W-shape beams shall conform to ASTM A36.

   c. Structural tubing and W-shape beams shall be hot dip galvanized according to 1.b. of this subsection. Damaged and abraded tubes and beams shall be repaired according to 1.c. of this subsection.

CR730.1-062204

Replace Subsection 730-2.05 with the following:

730-2.05 FLEXIBLE DELINEATOR POSTS. Durable fiberglass composite, polymer, or plastic material meeting the dimensions and colors shown on the Plans. Resistant to ultraviolet light, ozone and hydrocarbon damage and remain flexible at a temperature of minus 40 °F. Provide posts with reflectors that are capable of self-erecting and remaining serviceable after 5 head-on impacts at 55 mph and 10 impacts at 35 mph with an automobile at an air temperature of plus 40 °F.

Terminal Markers - Flexible (marker). The marker includes the pole/post/rod (pole), reflective and retroreflective sheeting and mounting hardware.

Provide durable markers: resistant to impact from (snow and vehicle), vandals, ultraviolet light, moisture, ozone, and hydrocarbons.

When the pole is loaded, the marker shall bend/flex, remain flexible and oriented as installed continuing to function as designed without permanent displacement along the length of the member. Provide the flexibility in the primary vertical element, a connecting device between the vertical element and connection to the support member (spring or other) or a combination.

Provide a connection sufficient to transfer the loads from the pole to the supporting member without reducing the strength, flexibility, or durability of either. The connection shall not negatively influence the performance of the guardrail. Provide approval of the connection from the marker manufacturer and support member manufacturer (if proprietary).

- Design Loads:
  - Impact load from snow thrown by snowplows
  - Weight of snow covering the pole (snow thrown from snowplows)
  - Wind loads (100 mph, 3 sec gust)
- Service Temperature Range: -40˚ F to +140˚ F.

- Pole:

  1. Material:

     - Steel, or
     - Stainless Steel, or
     - Other Poles:
       (a) Continuous glass fiber and marble reinforced thermosetting composite, or
       (b) Engineered plastic alloy, or
       (c) Fiberglass Reinforced Polyester (FRP)
       (d) High-Impact Polyolefins

  2. Dimensions

     - Top of Pole: 60 inches to 84 inches above top of guardrail
     - Width/Diameter: minimum = 1 1/4 inches, maximum = 2 inches (steel/stainless steel not be greater than 5/8 inch diameter)
     - Thickness: as required by design

  3. Visibility:

     - Daytime: Pole - color orange
       a. Steel and Stainless Steel Poles: Applied permanent finish.
       b. Other Poles: Color pigment ultraviolet stabilized and solid through the cross section from end to end.
     - Nighttime: Added retroreflective sheeting - color white
       a. Approximately 12 square inches visible from the traveled way before and after the marker. Applied to a flag attached to the pole or as banding applied directly to the pole. (A flag is required when using steel/stainless steel poles.)
       b. Place top edge of flag/banding 1 inch from top of pole.
          (1) Flag: Single retroreflective sheet each face
          (2) Banding: Two bands completely around marker, 4 inches between bands

- Hardware and Fasteners:

  - Steel, and/or
  - Stainless Steel, or
  - Aluminum alloy (hardware only)

Manufacturers of flexible markers (snowpoles):

Manufacturer	Model	Type	Contact
Nordic Fiberglass, Inc.	FF2	Steel Pole w/ Flag	Ph: (218) 745-5095
PEXCO	Model 3639	High-Impact Polyolefins	Ph: (404) 564-8560
New Century Northwest, LLC	NCN2549	Engineered Plastic Alloy	Ph: (541) 485-5566
Carsonite Composites, LLC	SNFB	Continuous glass fiber and marble reinforced thermosetting composite	Ph: (800) 648-7916

Submit manufacturer's specifications to the Engineer for review and approval before ordering terminal markers.

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APPENDIX A

CONSTRUCTION SURVEY REQUIREMENTS

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APPENDIX B

ENVIRONMENTAL PERMITS

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APPENDIX C

MATERIAL CERTIFICATION LIST

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APPENDIX D

SIGN SHOP DRAWINGS

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APPENDIX E

TEMPORARY CONSTRUCTION EASEMENTS

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