PART 4

STANDARD MODIFICATIONS

AND SPECIAL PROVISIONS

to the

STATE OF ALASKA

SPECIFICATIONS

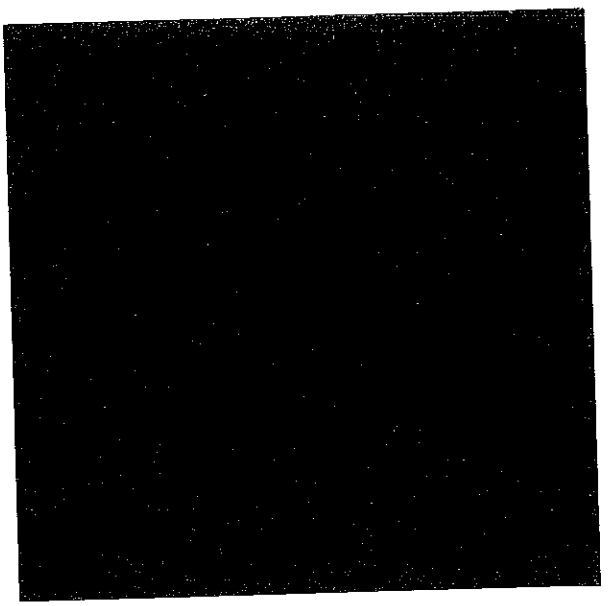
FOR

HIGHWAY CONSTRUCTION

2004

BRAGAW STREET SURFACE REHABILITATION

PROJECT: IM-0001(321)/57826



SECTION 101

DEFINITIONS AND TERMS

Special Provision

101-1.03 DEFINITIONS.

Add the following definition:

NON-FROST SUSCEPTIBLE. Material that contains 6 percent or less passing the No. 200 screen as determined by sieve analysis performed with WAQTC FOP for AASHTO T 27/T 11 on minus 3-inch material.

(11/29/01) R1USC

SECTION 102

BIDDING REQUIREMENTS AND CONDITIONS

Standard Modification

102-1.05 PREPARATION OF BID. *Modify the second sentence in the third paragraph, after:* "If a bidder is a corporation, the bid must be signed by a corporate officer," *add:* or agent. (6/30/04)E18

SECTION 105

CONTROL OF WORK

Special Provisions

105-1.06 COOPERATION WITH UTILITIES. *Add the following*: Request locates from all the utilities having facilities in the area. Use the Alaska Digline, Inc. Locate Call Center for the following utilities:

ALASKA DIGLINE, INC.
Locate Call Center Anchorage Area..... 278-3121 Statewide 800-478-3121 who will notify the following:
ACS Aircraft Service International Group Alaska Fiberstar Alaska Native Hospital Alaska Railroad Corp Anchorage School District Anchorage Water & Wastewater Alyeska Cable AT&T Alascom, Inc. Chugach Electric Assoc DOT Street Lights, State of Alaska Enstar Natural Gas GCI Communications MOA Street Maint. Dept MFS Technologies, inc. Tesoro Alaska Pipeline Municipality of Anchorage Municipal Light & Power PTI Telalaska

Call the following utilities and agencies directly:

Contact the Central Region Maintenance & Operations Office at (907) 269-0760 to obtain the appropriate District Superintendent's phone number for this project.

There are various utility appurtenances located within the project limits. Utilities scheduled for relocation are addressed in the following utility specific sections.

Right of Way and/or Construction surveying is required before utility relocation.

Payment will be made as follows:

1. Subsidiary to Item 642(1), Construction Surveying, if the Contractor is required to provide the surveying as part of the contract an/or

2. Under Item 642(3), Three Person Survey Party, if the construction or Right of Way staking required by the utility is either in advance of the two (2) week work plan, or not required by the contract.

The utility shall give the Contractor, through the Engineer, fifteen (15) calendar days advance written notice for required staking.
(09/01/04)R3

Provide the Utility Companies fifteen (15) calendar days advance written notice of the relocations described below to begin. The Utility Companies will not be required to work in more than one location at a time, and will be allowed to complete a specific section of work before beginning work with another section.

Relocation or adjustment of underground utility appurtenances will not normally be performed when the ground is frozen. In addition, the utility companies may prohibit the Contractor, through the Engineer, from working near the utility's facilities when the ground is frozen.

Specific coordination requirements for the specific utilities are included below:

MUNICIPAL LIGHT AND POWER (MLP): MLP has existing buried and overhead primary circuits running throughout the project limits. Conflicts exist with MLP facilities within the project limits.

1. A MLP transformer at Sta. 53+38, 65 Rt. is in conflict with the proposed sidewalk improvements. This facility will be relocated behind the proposed sidewalk improvements. MLP will require three (3) days to complete this relocation.

2. An existing utility pole, 92A, is in conflict with the proposed turn lane improvements at Sta. 56+00 Lt. The utility pole will be relocated behind the sidewalk at this location. MLP will require two (2) days to complete this relocation.

3. An existing utility pole, 91C, is in conflict with the proposed sidewalk improvements at Sta. 79+43 Lt. The utility pole will be relocated behind the sidewalk at this location. MLP will require two (2) days to complete this relocation.

4. An existing utility pole, 91C, is in conflict with the proposed turn lane improvements at Sta. 85+65 Lt. The utility pole will be relocated behind the sidewalk at this location. MLP will require two (2) days to complete this relocation.

5. Eight (8) existing utility poles are in conflict with the proposed sidewalk improvements at Sta: 75+20 42 Rt., 78+90 35 Rt., 78+90 45 Rt., 79+41 25 Rt. 85+65 26 Rt., 88+20 30 Rt., 92+05 35 Rt. and 92+60 35 Lt.. These facilities and the adjacent poles will be relocated underground. Adjacent poles are unable to be relocated behind sidewalk improvements due to the existing length of the mast arms. They may not be extended. Therefore, MLP overhead facilities from Sta. 71+80 to 92+15 will be relocated in an underground trench in the northbound lane 5.5' off face of curb. MLP will require thirty-eight (38) days to complete this relocation.

This work will need to be coordinated with the Contractor's work in these areas.

MLP contact is Gary Faraday at (907) 263-5283. MLP will require 10 calendar days written notice by fax at (907) 263-5472 prior to beginning utility relocation work.

ENSTAR NATURAL GAS COMPANY (ENSTAR): Enstar has existing buried facilities within the project limits which conflict with proposed construction in two locations.

1. At the intersection of Bragaw Street and DeBarr Road Sta. 53+40 Rt., an existing cathodic protection system will be relocated to a new location. Enstar will pothole an existing 3" plastic main to determine if required minimum depth of cover has been maintained due to the last reconstruction of this location. If the adequate cover has not been met, the line will be lowered in place as needed. Enstar will require two (2) days to complete this relocation.

2. At Sta. 85+00+/-, an existing 1" high pressure gas main stub out and valve will remain in place. The cathodic protection wiring will need to be extended to the west of the proposed new sidewalk. Enstar personnel should be onsite during excavation within 10 feet of this gas main. The Contractor shall locate, protect and work around this existing facility. Enstar will require one (1) day to complete this relocation.

At the intersection of Bragaw Street and DeBarr Road Sta. 52+35 Rt., an existing 4" high pressure steel gas main stub out and valve are within the area of proposed sidewalk and curb improvements. Enstar personnel should be onsite during excavation within 10 feet of this gas main. The Contractor shall locate, protect and work around this existing facility.

Enstar will provide traffic control to complete relocation and potholing work. Enstar's relocation work will be conducted within the Bragaw Street project limits and will need to be coordinated with the Contractor's work. A written fifteen day noticed is required from Department's contractor for commencement of ENSTAR work and each time there is a break in the project scheduling.

Prior to commencement of construction Enstar Natural Gas Company will perform a cathodic protection sweep to verify that the system is in working order. Problems found at that time will be the responsibility of the Utility. The Contractor shall notify Enstar at 264-3740, two (2) working days before sweep is to be performed and shall allow one (1) day for each sweep to be performed. A second sweep will be performed after all underground work has been completed, but prior to paving. Should either sweep detect a ground fault, the Contractor shall allow the utility time to repair the fault. If the ground fault is determined to be caused by the Contractors actions, the cost of repair shall be charged to the Contractor by the Utility.

When working near Enstar Natural Gas facilities, the Contractor shall adhere to the requirements set forth in "Safety Requirements for Excavation Adjacent to Natural Gas Pipelines", attached to these specifications as Appendix F.

Enstar contact is Dave Titus at (907) 264-3746.

ALASKA COMMUNICATIONS SYSTEMS (ACS): Conflicts exist with underground ACS lines within the project limits. ACS will be relocating telecommunications facilities.

1. Conflict exists within the Bragaw Street right of way in the location of the proposed turn lane and sidewalk construction. ACS underground facilities from Bragaw Sta. 83+50 to Sta. 87+80 will need to be relocated. The underground facilities include (2)-1200 pair, (2)-1800 pair and 24-strand Fiber Optic. ACS will require sixty (60) days to complete these relocations.

The ACS relocation work will be conducted within the Bragaw Street project limits and will need to be coordinated with the Contractor's work.

ACS contact is Kelly Ward at (907) 564-1424 or 244-2616.

GCI CABLE, INC. (GCI): Conflicts exist with GCI facilities within the project limits. GCI will be relocating overhead and underground cable television facilities.

1. In the northeast corner of E. 9th Avenue, an existing television pedestal located at Sta. 68+64, 45' Rt. is in conflict with sidewalk improvements. The pedestal will be relocated north and east of the existing pedestal behind the sidewalk improvements at this location. A section of the underground cable will be replaced from the relocated pedestal south to the next pedestal. GCI will require two (2) days to complete this relocation.

2. At the intersection of E. 4th Avenue, an existing aerial television pole at Sta. 85+32 32 Lt. is in conflict with the proposed turn lane construction. The aerial cable and pole will be removed. A new cable will be installed in underground conduit crossing of Bragaw Street south of E. 4th Avenue. The existing aerial cable will be restrung to a pole south of E. 4th Avenue. GCI will require four (4) days to complete this relocation.

The GCI relocation work will be conducted within the project limits and will need to be coordinated with the Contractor's work.

GCI contact is Bill Powell at (907) 244-0311.

ANCHORAGE WATER AND WASTEWATER UTILITY (AWWU): One conflict exists with the proposed turn lane construction. Adjustments may need to be made to existing AWWU facilities. Relocation work and adjustments will be performed by the Department's Contractor.

The Department's Contractor will be responsible for the furnishing of traffic control and personnel to assist AWWU while locating and performing the pre-construction and post-construction inspections.

Water

1. A fire hydrant located at Sta. 85+43.9, 30.9' Lt. is in conflict with the proposed turn lane reconstruction. The existing hydrant will be retired and a new hydrant installed at Sta. 85+43.9, 49' Lt. AWWU Operations and Maintenance will complete the final adjustment on the new hydrant.

2. Twenty-one (21) valve boxes will require adjustment by the Department's Contractor.

Sewer

1. Ten (10) existing Sanitary Sewer Manholes will require adjustment by the Department's Contractor.

2. Four (4) existing Sanitary Sewer Cleanouts will require adjustment by the Department's Contractor.

AWWU's Engineering Planning Section, 564-2765, should be contacted a minimum of five (5) days prior to construction to request a preconstruction inspection for existing facilities. The Department's Contractor will be responsible for furnishing traffic control and personnel to assist AWWU while performing the preconstruction inspection. When construction is substantially the complete, the Contractor shall contact AWWU's Engineering Planning Section to schedule a post construction inspection, to inspect the existing facilities to determine if any damage was done to existing facilities.

Coordination by the Department's Contractor with AWWU will be required. The AWWU contact is Brian Baus at 564-2765.
(10/22/04)R&M

105-1.15 PROJECT COMPLETION. *Delete the last paragraph and substitute the following:*
When work and cleanup provided for under the contract is found to be complete, except for work specified under Subsection 618-3.04, Plant Establishment and Maintenance; and Subsection 621-

3.04, Period of Establishment; Subsection 641-2.01, Storm Water Pollution Prevention Plan (SWPPP) Requirements and Subsection 641-3.01, Construction Requirements, a letter of project completion will be issued by the Engineer. Project completion will relieve the Contractor from further maintenance responsibilities, except under Subsections 618-3.04, and 621-3.04, 641-2.01, and 641-3.01, and will stop the count of contract time but will not relieve the Contractor of obligations under the Contract.
(05/28/03)R237USC02

Standard Modification

105-1.16 FINAL ACCEPTANCE AND RECORD RETENTION. *Modify the first paragraph, Item 4., after:* "DOLWD" *add:* and State Department of Revenue.
E19(6/30/04)

Special Provision

105-1.17 CLAIMS FOR ADJUSTMENT AND DISPUTES. *Add the following* Appeals to the superior court under AS 36.30.685 must be filed in the third judicial district.
(03/21/01)R93

SECTION 106

CONTROL OF MATERIALS

Special Provision

106-1.01 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS. *Add the following:*

Buy America Provision. Comply with the requirements of 23 CFR 635.410, Buy America Requirements, and submit a completed Material Origin Certificate, Form 25D-60, prior to award of the contract.

All steel and iron products which are incorporated into the work shall be manufactured in the United States except that minor amounts of steel and iron products of foreign manufacture may be used, provided the aggregate cost of such does not exceed one tenth of one percent (0.001) of the total contract amount, or $2,500, whichever is greater. For the purposes of this paragraph, the cost is the value of the products as they are delivered to the project including freight.

"Manufactured in the United States" means that all manufacturing processes starting with the initial mixing and melting through the final shaping, welding, and coating processes must be undertaken in the United States. The definition of "manufacturing process" is smelting or any subsequent process that alters the material's physical form, shape or chemical composition. These processes include rolling, extruding, machining, bending, grinding, drilling, etc. The application of coatings, such as epoxy coating, galvanizing, painting or any other coating that protects or enhances the value of steel or iron materials shall also be considered a manufacturing process subject to the "Buy America Requirements."

Buy America does not apply to raw materials (iron ore), pig iron, and processed, pelletized and reduced iron ore. It also does not apply to temporary steel items (e.g., temporary sheet piling, temporary bridges, steel scaffolding, and falsework). Further, it does not apply to materials which remain in place at the Contractor's convenience (e.g., sheet pilings, and forms).

The North American Free Trade Agreement (NAFTA) does not apply to the Buy America requirement. There is a specific exemption within NAFTA (Article 1001) for grant programs such as the Federal-aid highway program.

When steel and iron products manufactured in the United States are shipped to a foreign country where non steel or iron products are installed on or in them (e.g., electronic components in a steel cabinet), the steel and iron is considered to meet the requirements of this Subsection.

Take whatever steps are necessary to ensure that all manufacturing processes for each covered product comply with this provision. Non-conforming products shall be replaced at no expense to the State. Failure to comply may also subject the Contractor to default and/or debarment. False statements may result in criminal penalties prescribed under Title 18 US Code Section 1001 and 1020.
(08/31/99) S13

106-1.02 LOCAL MATERIAL SOURCES.

Add the following under Item 1. General:

"Hard Aggregate" or sources having aggregate that meet the Nordic Abrasion values specified in Section 703 can be obtained from, but are not limited to, the following locations:

1. Cantwell, Alaska or on the Denali Highway (contact Regional Geologist John Fritz at (907) 269-6200 for details on location and ownership;

2. Glacier NW Pioneer Aggregate site in Dupont, WA (http://www.glaciernw.com); and

3. CEWE LTD in Coquitlam, BC (http://www.cewe.com).

Add the following under Item 2. Inspection and Acceptance:

In compliance with 30CFR46.11, have the Operator of the sand and gravel surface mine (materials source) provide *Site-specific Hazard Awareness Training* for the Engineer's personnel (non-miners) before beginning operations in the surface mine. Offer the training at each surface mine that will be used to supply processed aggregates. A competent person must provide the training according to the Operator's written training plan as approved by the *Mine Safety and Health Administration*, and covering the following items:

a. Site specific health and safety risks.
b. Recognition and avoidance of hazards.
c. Restricted areas.
d. Warning and evacuation signals.
e. Other special safety procedures.
f. Site tour.

Upon completion of this training, the Engineer's personnel will sign a Visitor's Log Book to indicate that training was provided.

(05/01/02) R262M98

SECTION 107

LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Special Provision

107-1.02 PERMITS, LICENSES AND TAXES.

Add the following:

Obtain a written statement from the State Historic Preservation Officer stating that material disposal, extraction, stockpiling or staging, on any off project site, is not expected to impact cultural resources. The State Historic Preservation Officer is with the Department of Natural Resources in Anchorage, and may be contacted at (907) 269-8715. If cultural resources are discovered during construction activities, stop work at that site and notify the Engineer.

Provide a wetland specialist able to conduct wetlands determinations and delineations according to the Corps of Engineers 1987 Wetland Delineation Manual. The wetland specialist shall conduct the determination and delineations of sites outside the project limits or not previously permitted, that could be impacted by the Contractor's operations. These delineations will be subject to Corps of Engineers approval.

Provide the Engineer a copy of permits or clearances received before using sites outside the project limits. Additionally, provide the Engineer a written statement that permits or clearances have been obtained. Also provide a written statement to the Engineer listing agencies or offices contacted that responded that no additional action is required.

If contamination is unexpectedly encountered, then all work which would affect the site will be immediately halted and DEC contacted. A DEC officer in Anchorage may be contacted at 269-7590.

If the Contractor wishes to work between the hours of 10PM and 7AM, then the Contractor is required to obtain a Municipal Noise Permit.

Add the following:

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

National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit #AKS 05255-8. Ex. Date July 1, 2008. Provide information to comply with the U.S. Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) MS4 Permit #AKS 05255-8 to discharge storm water from the construction site. The Municipality and ADOT&PF are co-permittees of this permit.

Alaska Department of Environmental Conservation Non-Domestic Storm Water Plan Review, Letter of Non-Objection, Dated April 29, 2004.

(05/29/02) R7M98

Add the following Subsection:

107-1.21 FEDERAL AFFIRMATIVE ACTION. The Federal Equal Employment Opportunity, Disadvantaged Business Enterprise, and On-the-Job Training affirmative action program requirements that are applicable to this Contract are contained in the project Special Provisions and Contract Forms, and may include:

Disadvantaged Business Enterprise (DBE) Program	Section 120
Training Program	Section 645
Federal EEO Bid Conditions	Form 25A-301
EEO-1 Certification	Form 25A-304
DBE Subcontractable Items	Form 25A-324
ADOT&PF Training Program Request	Form 25A-310
Training Utilization Report	Form 25A-311
Contact Report	Form 25A-321A
DBE Utilization Report	Form 25A-325C
Summary of Good Faith Effort Documentation	Form 25A-332A
Required Contract Provisions, Federal-Aid Contracts	Form 25D-55

In addition to the sanctions provided in the above references, non-compliance with these requirements is grounds for withholding of progress payments.
(01/22/02)S80

SECTION 108

PROSECUTION AND PROGRESS

Special Provision

108-1.03 PROSECUTION AND PROGRESS. *Delete the last sentence of the first paragraph and substitute the following:*

Submit the following at the Preconstruction Conference:

Delete item 1. A progress schedule, and substitute the following:

1. A Critical Path Method (CPM) Schedule is required, in a format acceptable to the Engineer, showing the order the work will be carried out and the contemplated dates the Contractor and subcontractors will start and finish each of the salient features of the work, including scheduled periods of shutdown. Indicate anticipated periods of multiple-shift work in the CPM Schedule. Revise to the proposed CPM Schedule promptly. Promptly submit a revised CPM Schedule if there are substantial changes to the schedule, or upon request of the Engineer.

(12/13/02) R261M98

Delete Item 5 of the first paragraph and substitute the following:

5. The submittals identified under Subsection 641-1.03, Submittals.

(01/31/02) R160M98

SECTION 109

MEASUREMENT AND PAYMENT

Special Provision

109-1.06 PROGRESS PAYMENTS.

Add the following:

Failure to submit schedules according to Subsection 108-1.03, Prosecution and Progress will result in withholding an amount equal to 5 percent of the total amount earned from subsequent progress payments. The Engineer, upon receipt of current schedules from the Contractor, will release this amount.

Failure to comply with the requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit for Alaska, as indicated under Section 641, Erosion, Sediment, and Pollution Control, will result in withholding an amount equal to 5 percent of the total amount earned from subsequent progress payments. This amount will be released by the Engineer upon satisfactory completion of the requirements of the permit.
(02/04/02) R137A

109-1.07 PAYMENT FOR MATERIALS ON HAND. *Add the following:* The location of stockpiled materials for payment in acceptable storage facilities off the project will be in Alaska, at a location acceptable to the Engineer. (9/1/89)R16

Standard Modification

109-1.08 FINAL PAYMENT. *Add the following sentence to the first paragraph:*
The Department will not process the final estimate until the Contractor completes Items 1 through 4 in the first paragraph of subsection 105-1.16.
E11(6/30/04)

Add the following Section:

SECTION 120

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM

Special Provision

120-1.01 DESCRIPTION.

The work consists of providing Disadvantaged Business Enterprises (DBEs), as defined in Title 49, CFR (Code of Federal Regulations), Part 26, with the opportunity to participate on an equitable basis with other contractors in the performance of contracts financed in whole, or in part, with federal funds. The Contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. Carry out applicable requirements of 49 CFR Part 26 in the award and administration of USDOT assisted contracts.

120-1.02 INTERPRETATION.

It is the intent of this Section to implement the requirements of 49 CFR, Part 26, and the Department's federally approved DBE Program.

120-1.03 ESSENTIAL CONTRACT PROVISION.

Failure to comply with the provisions of this Section will be considered a material breach of contract, which may result in the termination of this contract or such other remedy as ADOT&PF deems appropriate. The Department also considers failure to comply with this Section to be so serious as to justify debarment action as provided in AS 36.30.640(4).

120-1.04 DEFINITIONS AND TERMS.

The following definitions will apply.

1. Broker. A DBE certified by the Department that arranges for the delivery or provision of creditable materials, supplies, equipment, transportation/hauling, insurance, bonding, etc., within its certified category, that is necessary for the completion of the project. A broker of materials certified in a supply category must be responsible for scheduling the delivery of materials and fully responsible for ensuring that the materials meet specifications before credit will be given.

2. Commercially Useful Function (CUF). The execution of the work of the Contract by a DBE carrying out its responsibilities by actually performing, managing, and supervising the work involved using its own employees and equipment. The DBE shall be responsible, with respect to materials and supplies used on the Contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a commer-

cially useful function, an evaluation of the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the Contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work. Other relevant factors will be considered. The determination of CUF is made by the Engineer after evaluating the way in which the work was performed during the execution of the Contract.

3. Disadvantaged Business Enterprise (DBE). An enterprise which is a for-profit small business concern

   a. that is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock is owned by one or more such individuals;

   b. whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it; and

   c. has been certified by the Department in accordance with 49 CFR, Part 26.

4. DBE Key Employee. Permanent employees identified by the DBE owner in its certification file in the Department Civil Rights Office.

5. DBE Utilization Goal. The percent of work to be performed by certified DBEs that is established by the Department and specified in the Contract.

6. Good Faith Efforts. Efforts by the bidder or Contractor to achieve a DBE goal or other requirement of 49 CFR Part 26, by their scope, intensity, and appropriateness to the objective, that can reasonably be expected to fulfill the program requirement.

7. Manufacturer. A DBE certified by the Department in a supply category that changes the shape, form, or composition of original material in some way and then provides that altered material to the project and to the general public or the construction industry at large on a regular basis.

8. Notification. For purposes of soliciting DBE participation on a project and to count toward a contractor's Good Faith Efforts, notification shall be by letter or fax transmission, with a return receipt requested or successful transmission report. Telephonic contact with a DBE may be allowed, however it shall be based on the ability of Civil Rights staff to independently verify this contact.

9. Regular Dealer. A DBE certified by the Department in a supply category that:

   a. maintains an in-house inventory on a regular basis of the particular product provided to this project; and

b. keeps an inventory in an amount appropriate for the type of work using that product; and

c. offers that inventory for sale to the general public or construction industry at large (private and public sectors), not just supplied as needed on a project by project basis during the construction season, except where the product requires special or heavy equipment for delivery and the DBE possesses and operates this equipment on a regular basis throughout the construction season in order to deliver the product to the general public or construction industry at large. If the distribution equipment is rented or leased, it must be on a repetitive, seasonal basis; and may additionally

d. fabricate (assembles large components) for use on a construction project, consistent with standard industry practice, for delivery to the project.

120-2.01 UTILIZATION GOAL.

The DBE Utilization Goal for this contract is shown on Form 25A324 (DBE Subcontractable Items) as a percentage of the total basic bid amount. A DBE may be considered creditable towards meeting the DBE Utilization Goal at time of Contract award, if the DBE is certified by the Department in a category covering the CUF to be performed at the time of listing on Form 25A325C (DBE Utilization Report).

A bidder shall demonstrate the ability to meet the DBE Utilization Goal or perform and document all of the required Good Faith Efforts under Subsection 120-3.02 in order to be eligible for award of this Contract.

If the quantity of work of a bid item involving a DBE firm is reduced by the Department, the DBE Utilization Goal on Form 25A325C will be reduced proportionately.

120-3.01 DETERMINATION OF COMPLIANCE.

1. Phase I - Bid. Each bidder must register with the Civil Rights Office annually in accordance with §§26.11 & 26.53(b)(2)(iv) of 49 CFR, Part 26. No contract may be awarded to a bidder that is not registered.

2. Phase II - Award. The apparent low bidder will provide the following within 15 days of receipt of notice of intent to award:

   a. **Written DBE Commitment.** Written commitments from DBEs to be used on the project. The written commitment shall contain the following information:

      1) A description of the work that each DBE will perform;

      2) The dollar amount of participation by the DBE firm;

3) Written documentation of the bidder/offeror's commitment to use a DBE subcontractor whose participation it submits to meet a contract goal; and

4) Written confirmation from the DBE that it is participating in the contract as provided in the prime Contractor's commitment.

b. **DBE Utilization Report**. Form 25A325C listing the certified DBEs to be used to meet the DBE Utilization Goal.

c. **Good Faith Effort Documentation.** Summary of Good Faith Effort Documentation (Form 25A332A and attachments) and DBE Contact Reports (Form 25A321A) if the Contractor submits less DBE utilization on Form 25A325C than is required to meet the DBE Utilization Goal. If accepted by the Department, this lower DBE utilization becomes the new DBE Utilization Goal. If the bidder cannot demonstrate the ability to meet the DBE Utilization Goal, and can not document the minimum required Good Faith Efforts (as outlined in Subsection 120-3.02 below), the Contracting Officer will determine the bidder to be not responsible.

3. Phase III - Construction.

a. **Designation of DBE/EEO Officer**. At the preconstruction conference, submit, in writing, the designation of a DBE/EEO officer.

b. **DBE Creditable Work.** The CUF work items and creditable dollar amounts shown for a DBE on the DBE Utilization Report (Form 25A325C) shall be included in any subcontract, purchase order or service agreement with that DBE.

c. **DBE Replacement**. If a DBE replacement is approved by the Engineer, replace the DBE with another DBE for the same work in order to fulfill its commitment under the DBE Utilization Goal. In the event that the Contractor cannot obtain replacement DBE participation, the Engineer may adjust the DBE Utilization Goal if, in the opinion of the Engineer and the Civil Rights Office, both of the following criteria have been met:

1) The Contractor has not committed any discriminatory practice in its exercise of good business judgment to replace a DBE.

2) If the Contractor is unable to find replacement DBE participation and has adequately performed and documented the Good Faith Effort expended in accordance with Subsection 120-3.02.

d. **DBE Utilization Goal.** The DBE Utilization Goal will be adjusted to reflect only that amount of the DBE's work that can not be replaced.

120-3.02 GOOD FAITH EFFORT.

1. **Good Faith Effort Criteria.** The Contracting Officer will use the following criteria to judge if the bidder, who has not met the DBE Utilization Goal, has demonstrated sufficient Good Faith Effort to be eligible for award of the contract.

   Failure by the bidder to perform and document all of the following actions constitutes insufficient Good Faith Effort.

   a. Consideration of all subcontractable items. The bidder shall, at a minimum, seek DBE participation for each of the subcontractable items upon which the DBE goal was established as identified by the Department (on Form 25A324) prior to bid opening. It is the bidder's responsibility to make the work listed on the subcontractable items list available to DBE firms, to facilitate DBE participation.

   b. If the bidder can not achieve the DBE Utilization Goal using the list of available DBE firms based on the subcontractable items list, then the bidder may consider other items that could be subcontracted to DBEs.

   c. Notification to all active DBEs listed for a given region in the Department's most current DBE Directory at least 7 calendar days prior to bid opening. The bidder must give the DBEs no less than five days to respond. The bidder may reject DBE quotes received after the deadline. Such a deadline for bid submission by DBEs will be consistently applied. DBEs certified to perform work items identified on Form 25A324 must be contacted to solicit their interest in participating in the execution of work with the Contractor. Each contact with a DBE firm will be logged on a Contact Report (Form 25A321A).

   d. Non-competitive DBE quotes may be rejected by the bidder. Allegations of non-competitive DBE quotes must be documented and verifiable. A DBE quote that is more than 10.0% higher than the accepted non-DBE quote will be deemed non-competitive provided the DBE and non-DBE subcontractor quotes are for the exact same work or service. Bidders must have a non-DBE subcontractor quote for comparison purposes. Such evidence shall be provided in support of the bidder's allegation. Where the bidder rejects a DBE quote as being non-competitive under this condition, the work must be performed by the non-DBE subcontractor and payments received by the non-DBE subcontractor during the execution of the Contract shall be consistent with the non-DBE's accepted quote. This does not preclude increases as a result of Change documents issued by the Department.

   e. Provision of assistance to DBEs who need help in obtaining information about bonding or insurance required by the bidder.

f. Provision of assistance to DBEs who need help in obtaining information about securing equipment, supplies, materials, or related assistance or services.

g. Providing prospective DBEs with adequate information about the requirements of the Contract regarding the specific item of work or service sought from the DBE.

h. Follow-up of initial notifications by contacting DBEs to determine whether or not they will be bidding. Failure to submit a bid by the project bid opening or deadline by the bidder is de facto evidence of the DBE's lack of interest in bidding. Documentation of follow-up contacts shall be logged on the Contact Report (Form 25A321A).

i. Items c through h will be utilized to evaluate any request from the Contractor for a reduction in the DBE Utilization Goal due to the default or decertification of a DBE and the Contractor's subsequent inability to obtain additional DBE participation.

2. Administrative Reconsideration. Under the provisions of 49 CFR Part 26.53(d), if it is determined that the apparent successful bidder has failed to meet the requirements of this Subsection, the bidder must indicate whether they would like an opportunity for administrative reconsideration. Such an opportunity must be exercised by the bidder within 3 calendar days of notification it has failed to meet the requirements of this Subsection. As part of this reconsideration, the bidder must provide written documentation or argument concerning the issue of whether it met the goal or made adequate good faith efforts to do so.

a. The decision on reconsideration will be made by the DBE Liaison Officer.

b. The bidder will have the opportunity to meet in person with the DBE Liaison Officer to discuss the issue of whether it met the goal or made adequate good faith efforts to do so. If a meeting is desired, the bidder must be ready, willing and able to meet with the DBE Liaison Officer within 4 days of notification that it has failed to meet the requirements of this Subsection.

c. The DBE Liaison Officer will render a written decision on reconsideration and provide notification to the bidder. The written decision will explain the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so.

d. The result of the reconsideration process is not administratively appealable to U.S. DOT.

120-3.03 COMMERCIALLY USEFUL FUNCTION (CUF).

1. **Creditable Work.** Measurement of attainment of the DBE Utilization Goal will be based upon the actual amount of money received by the DBEs for creditable CUF work on this project as determined by the Engineer in accordance with this Section. CUF is limited to that of a:

   a. regular dealer;
   b. manufacturer;
   c. broker;
   d. subcontractor;
   e. joint-venture; or
   f. prime contractor.

2. **Determination of Commercially Useful Function.** In order for the CUF work of the DBE to be credited toward the goal, the Contractor will ensure that all of the following requirements are met:

   a. The CUF performed by a DBE certified in a supply category will be evaluated by the Engineer to determine whether the DBE performed as either a broker, regular dealer, or manufacturer of the product provided to this project.

   b. A DBE trucking firm certified and performing work in a transportation/hauling category is restricted to credit for work performed with its own trucks and personnel certified with the CRO prior to submitting a bid to a contractor for DBE trucking. The DBE trucking firm must demonstrate that it owns all trucks (proof of title and/or registration) to be credited for work and that all operators are employed by the DBE trucking firm. A DBE trucking firm that does not certify its trucks and personnel that it employs on a job will be considered a broker of trucking services and limited to credit for a broker. (This does not affect the CUF of that same firm, when performance includes the hauling of materials for that work.)

   c. The DBE is certified in the appropriate category at the time of:

      1) the Engineer's approval of the DBE subcontract, consistent with the written DBE commitment; and

      2) the issuance of a purchase order or service agreement by the Contractor to a DBE performing as either a manufacturer, regular dealer, or broker (with a copy to the Engineer).

   d. The Contractor will receive credit for the CUF performed by DBEs as provided in this Section. Contractors are encouraged to contact the Engineer in advance of the execution of the DBE's work or provision of goods or services regarding CUF and potential DBE credit.

e. The DBE may perform work in categories for which it is not certified, but only work performed in the DBE's certified category meeting the CUF criteria may be credited toward the DBE Utilization Goal.

f. The work of the DBE firm must meet the following criteria when determining when CUF is being performed by the DBE:

1) The work performed will be necessary and useful work required for the execution of the Contract.

2) The scope of work will be distinct and identifiable with specific contract items of work, bonding, or insurance requirements.

3) The work will be performed, controlled, managed, and supervised by employees normally employed by and under the control of the certified DBE. The work will be performed with the DBE's own equipment. Either the DBE owner or DBE key employee will be at the work site and responsible for the work.

4) The manner in which the work is sublet or performed will conform to standard, statewide industry practice within Alaska, as determined by the Department. The work or provision of goods or services will have a market outside of the DBE program (must also be performed by non-DBE firms within the Alaskan construction industry). Otherwise, the work or service will be deemed an unnecessary step in the contracting or purchasing process and no DBE credit will be allowed.

There will be no DBE credit for lower-tier non-DBE subcontract work.

5) The cost of the goods and services will be reasonable and competitive with the cost of the goods and services outside the DBE program within Alaska. Materials or supplies needed as a regular course of the Contractor's operations such as fuel, maintenance, office facilities, portable bathrooms, etc. are not creditable.

The cost of materials actually incorporated into the project by a DBE subcontractor is creditable toward the DBE goal only if the DBE is responsible for ordering and scheduling the delivery of creditable materials and fully responsible for ensuring that the materials meet specifications.

6) All subcontract work, with the exception of truck hauling, will be sublet by the same unit of measure as is contained in the Bid Schedule unless prior written approval of the Engineer is obtained.

7) The DBE will control all business administration, accounting, billing, and payment transactions. The prime contractor will not perform the business, accounting, billing, and similar functions of the DBE. The Engineer may, in accordance with AS 36.30.420(b), inspect the offices of the DBE and audit the records of the DBE to assure compliance.

g. On a monthly basis, report on Form 25A336 (Monthly Summary of DBE Participation) to the Department Civil Rights Office the payments made (canceled checks or bank statements that identify payer, payee, and amount of transfer) for the qualifying work, goods and services provided by DBEs.

3. **Decertification of a DBE.** Should a DBE performing a CUF become decertified during the term of the subcontract, purchase order, or service agreement for reasons beyond the control of and without the fault or negligence of the Contractor, the work remaining under the subcontract, purchase order, or service agreement may be credited toward the DBE Utilization Goal.

Should the DBE be decertified between the time of Contract award and the time of the Engineer's subcontract approval or issuance of a purchase order or service agreement, the work of the decertified firm will not be credited toward the DBE Utilization Goal. The Contractor must still meet the DBE Utilization Goal by either:

a. withdrawing the subcontract, purchase order or service agreement from the decertified DBE and expending Good Faith Effort (Subsection 120-3.02, Items c through h) to replace it with one from a currently certified DBE for that same work or service through subcontractor substitution (Subsection 103-1.01); or

b. continuing with the subcontract, purchase order or service agreement with the decertified firm and expending Good Faith Effort to find other work not already subcontracted out to DBEs in an amount to meet the DBE Utilization Goal through either:

1) increasing the participation of other DBEs on the project;
2) documenting Good Faith Efforts (Subsection 120-3.02, items c through h); or
3) by a combination of the above.

4. **DBE Rebuttal of a Finding of no CUF.** Consistent with the provisions of 49 CFR, Part 26.55(c)(4)&(5), before the Engineer makes a final finding that no CUF has been performed by a DBE firm the Engineer will coordinate notification of the presumptive finding through the Civil Rights Office to the Contractor, who will notify the DBE firm. The Engineer, in cooperation with the Civil Rights Office, may determine that the firm is performing a CUF if the rebuttal information convincingly demonstrates the type of work involved and normal industry practices establishes a CUF was performed by the DBE. Under no circumstances shall the Contractor take any action against the DBE firm until the

Engineer has made a final determination. The Engineer's decisions on CUF matters are not administratively appealable to U.S. DOT.

120-3.04 DEFAULT OF DBE.

In the event that a DBE firm under contract or to whom a purchase order or similar agreement has been issued defaults on their work for whatever reason, immediately notify the Engineer of the default and the circumstances surrounding the default.

Take immediate steps, without any order or direction from the Engineer, to retain the services of other DBEs to perform the defaulted work. In the event that the Contractor cannot obtain replacement DBE participation, the Engineer may adjust the DBE Utilization Goal if, in the opinion of the Engineer, the following criteria have been met:

1. The Contractor was not at fault or negligent in the default and that the circumstances surrounding the default were beyond the control of the Contractor; and

2. The Contractor is unable to find replacement DBE participation at the same level of DBE commitment and has adequately performed and documented the Good Faith Effort expended in accordance with items c through h of Subsection 120-3.02 for the defaulted work; or

3. It is too late in the project to provide any real subcontracting opportunities remaining for DBEs.

The DBE Utilization Goal will be adjusted to reflect only that amount of the defaulted DBE's work that can not be replaced.

120-4.01 METHOD OF MEASUREMENT.

The Contractor will be entitled to count toward the DBE Utilization Goal those monies actually paid to certified DBEs for CUF work performed by the DBE as determined by the Engineer. The Contractor will receive credit for the utilization of the DBEs, as follows:

1. Credit for the CUF of a DBE prime contractor is 100% of the monies actually paid to the DBE under the contract for creditable work and materials in accordance with 49 CFR 26.55.

2. Credit for the CUF of a subcontractor is 100% of the monies actually paid to the DBE under the subcontract for creditable work and materials. This shall include DBE trucking firms certified as a subcontractor and not a broker. Trucks leased from another DBE firm shall also qualify for credit and conforms to the provisions of 49 CFR 26.55(d).

3. Credit for the CUF of a manufacturer is 100% of the monies paid to the DBE for the creditable materials manufactured.

4. Credit for the CUF of a regular dealer of a creditable material, product, or supply is 60% of its value. The value will be the actual cost paid to the DBE but will not exceed the bid price for the item.

5. Credit for the CUF of a broker performed by a DBE certified in a supply category for providing a creditable material, product or supply is limited to a reasonable brokerage fee. The brokerage fee will not exceed 5% of the cost of the procurement contract for the creditable item.

6. Credit for the CUF of a broker performed by a DBE certified in the transportation/hauling category for arranging for the delivery of a creditable material, product or supply is limited to a reasonable brokerage fee. The brokerage fee will not exceed 5% of the cost of the hauling subcontract.

7. Credit for the CUF of a broker performed by a DBE certified in a bonding or insurance category for arranging for the provision of insurance or bonding is limited to a reasonable brokerage fee. The brokerage fee will not exceed 5% of the premium cost.

8. Credit for the CUF of a joint venture (JV) (either as the prime contractor or as a subcontractor) may not exceed the percent of the DBE's participation in the joint venture agreement, as certified for this project by the Department. The DBE joint venture partner will be responsible for performing all of the work as delineated in the certified JV agreement.

120-5.01 BASIS OF PAYMENT.

Work under this item is subsidiary to other contract items and no payment will be made for meeting or exceeding the DBE Utilization Goal.

If the Contractor fails to utilize the DBEs listed on Form 25A325C as scheduled or fails to submit required documentation to verify proof of payment or documentation requested by the Department to help in the determination of CUF, the Department will consider this to be unsatisfactory work. If the Contractor fails to utilize Good Faith Efforts to replace a DBE, regardless of fault (except for Subsection 120-3.04 item 3), the Department will also consider this unsatisfactory work. Unsatisfactory work may result in disqualification of the Contractor from future bidding under Subsection 102-1.13 and withholding of progress payments consistent with Subsection 109-1.06.

(11/17/00) S33

SECTION 202

REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Special Provision

202-1.01 DESCRIPTION. *Add the following:* This work also consists of pavement planing as specified in this Section.

(2/28/01)R143USC

202-3.01 GENERAL. *Add the following:* Carefully remove fences designated by the Engineer to the right of way limit, or to the end of the span beyond the right of way limit. These materials belong to the property owners, and shall be salvaged and stacked neatly in their yards. After the construction of fence is complete, use salvaged fencing to fill possible fencing gaps behind the property line. Use salvaged fencing according to Section 607, for reconstructed fences.

(10/24/02) R17USC

202-3.04 REMOVAL OF PIPE *Delete this subsection in its entirety and replace with the following*: All storm drain and culvert pipe removed becomes your property.
(3/6/04)R&M

202-3.05 REMOVAL OF PAVEMENT, SIDEWALKS AND CURBS. *Add the following:*

Sawcut and remove existing pavement in areas of distress, cold patches or potholes as directed by the Engineer. The pavement shall be removed to a distance of 1 foot outside of the describe areas. Pavement that is removed shall be replaced with Asphalt Concrete as shown on the Plans according to the requirements of Section 401, Asphalt Concrete Pavement.
(2/28/01)R257USC

Pavement removed may be used for embankment construction if it is not exposed at the completed embankment surface. The maximum allowable dimension of the broken asphalt pieces is 6 inches.

Stockpile all removed pavement not incorporated into the project at the MOA KLOEP Station at 5701 Northwood Street. Coordinate with Street Maintenance Control Center at 343-8277 for acceptance of removed pavement and to confirm the desired locations of the stockpiles.

Obtain a solid waste disposal permit from DEC or use a site previously approved by DEC for disposal of removed asphalt if not using it in the embankment or use a site previously approved by DEC for disposal of removed asphalt. A DEC permitting officer in Anchorage may be contacted at 269-7590.
(3/29/01) R84USC (3/6/04)R&M

A DEC approved site for disposal of removed asphalt is available at no charge to the Contractor at the Hiland Road Solid Waste Facility. In order to use this site, the Contractor shall meet the following requirements:

1. Dumping shall be coordinated through the Eagle River Street Maintenance office at (907) 694-3487.

2. Leveling course material may be included with removed asphalt if it does not exceed 30 percent of the total volume delivered.

3. For quantities over 500 tons, the Contractor shall stockpile materials in a manner acceptable to the Municipality of Anchorage.

4. The broken asphalt pieces shall be 6 inches or less in maximum dimension.

(10/17/96)R84A (11/08/04)R&M

Add the following Subsections:

202-3.06 PAVEMENT PLANING. Remove existing asphalt concrete pavement by cold planing at locations shown on the Plans. The surface of the pavement after planing shall be uniformly rough grooved or ridged.

Remove planed material from the project immediately after planing. Stockpile planed material at the MOA KLOEP Station maintenance yard located at 5701 Northwood Street. Coordinate with Street Maintenance Control Center at 343-8277 for acceptance of material and desired location of stockpile. Planed material not acceptable to the maintenance chief will be disposed of in an acceptable manner or incorporated into the road structural prism as directed by the Engineer. Disposal areas shall be outside the project limits and according to Subsection 202-3.05, Removal of Pavement, Sidewalks and Curbs. If the material is to be disposed at a site other than the specified maintenance yard, the Contractor shall obtain written consent from the property owner before disposal. The Contractor shall obtain a solid waste disposal permit from the Department of Environmental Conservation (DEC) or use a site previously approved by DEC for disposal of removed asphalt. ADEC permitting officer in Anchorage may be contacted at 269-7590.

During the planing operation, sweep the streets with mechanical sweepers equipped with vacuum and water sprinkling devices to control dust and remove loose material from the planed areas. The removal operation shall follow within 50 feet of the planing machine.

Do not allow traffic to travel on surfaces that have an abrupt longitudinal planed edge greater than 2 inches. In the event that it is necessary to route traffic across such edges, an asphalt concrete transition 2 feet in width shall be placed adjacent to the edge and to gutters.

Maintain a tolerance of 0.1 inch between adjacent passes by the planer.

Remove existing asphalt concrete pavement overlay from gutters adjacent to the area being planed.

The existing curb and gutter not designated for removal shall not be damaged or disturbed. Damage caused by the planing operation shall be removed and replaced by the Contractor at the Contractor's expense.

The planing machine shall be specifically designed for the removal of bituminous pavement without the addition of heat. The cutting drum shall be a minimum of 5 feet wide and shall be equipped with cutting teeth placed in a variable lacing pattern to produce the desired finish.

The planing machine shall have the following capabilities:

1. operating speeds from 0 to 40 feet per minute,
2. self-propelled,
3. able to spray water at the cutting drum to minimize dust,
4. able to remove material next to the gutter,
5. designed so that the operator can at times observe the planing operation without leaving the controls,
6. adjustable as to slope and depth,
7. longitudinal grade control automatically actuated by the use of a 30 foot ski, and
8. able to cut up to 3 inches without producing fumes or smoke.

Provide a smaller machine to trim areas that are inaccessible to the larger machine at manholes, valve covers, curb returns, and intersections.
(2/28/01) R143USC

202-3.07 SALVAGING. Notify the Engineer a minimum of five (5) days before removing manholes and inlets. The Engineer will notify Street Maintenance Control Center at 343-8277 and upon excavation have an MOA maintenance representative identify manholes, inlets or portions thereof to be salvaged. Deliver items designated for salvage to the MOA KLOEP Station at 5701 Northwood Street. Items not designated for salvage by MOA maintenance shall become the Contractor's property.
(07/08/03) R258M98

202-5.01 BASIS OF PAYMENT.

After the third paragraph, add the following:

Item 202(15). At the contract price per unit specified. Payment is full compensation for mechanical sweepers during planing operations, removal of pavement from the gutter and stockpile of planed material per Subsection 202-3.06.

All required crushing, hauling and stockpiling of pavement materials to the specified MOA Maintenance Yard shall be subsidiary to Item 202(2), Removal of Pavement.

Replace Loop detectors damaged by the planing operation according to Section 660. Replace damage loop detectors at no additional expense to the Department. Contractor is required to maintain an operational traffic loop until new loops can be installed. If loops are encountered within the planing depth specified in the plans, their replacement will be measured and paid as Item 660(11) Traffic Loop (or under Section 109-1.05, Compensation For Extra Work).
(2/28/01) R143USC

Add the following:

Item 202(13). At the contract unit price for the actual length of fence taken down, disposed or delivered to the owner, regardless of the type or height. Payment includes full compensation for labor and materials required to perform this work.
(10/24/02) R17USC

Item 202(6) At the contract unit price for the each manhole removed. Payment includes full compensation for labor and materials required to remove and dispose existing storm drain pipe located between the manhole removed and new drainage structures.
(11/16/04) R&M

Payment will be made under:

Pay Item	Pay Unit
202(3A) Removal of Concrete Sidewalk	Square Yard
202(3B) Removal of Asphalt Sidewalk	Square Yard
202(13) Removal of Fence	Linear Foot
202(15) Pavement Planing	Square Yard

SECTION 203

EXCAVATION AND EMBANKMENT

Special Provision

203-3.03 EMBANKMENT CONSTRUCTION. *Delete the first sentence of the tenth paragraph, and substitute the following:* Place roadway embankment of earth materials in horizontal layers not exceeding 8 inches in thickness measured before compaction. Each layer of classified material shall have its joint offset from the joint below, longitudinally by 1 foot and transversely by 10 feet.

Add the following: Where the plans call for placement of selected material and excavation is required, the existing material may be left in place at the Engineer's discretion if tests determine that it will meet the appropriate selected material requirements. Reduction in excavation or Borrow quantities because of this condition shall not constitute a basis for adjustment in contract unit prices except as provided for in Section 104 Scope of Work.
(11/05/02)R23USC02 (11/17/04)R&M

203-3.04 COMPACTION WITH MOISTURE AND DENSITY CONTROL.

Delete this Subsection in its entirety and substitute the following:

Construct embankments with moisture and density control from specified materials placed and compacted at approximately optimum moisture content. Dry or moisten material as required.

Compact embankment material to not less than 95% of the maximum dry density as determined by WAQTC FOP FOR AASHTO T 99/T 180/WAQTC TM 9, or ATM T-12. The Engineer will determine in-place field densities using WAQTC TM 7 and WAQTC FOP for AASHTO T 224.

The Engineer will determine the maximum dry density of free-draining, non-plastic, cohesionless materials with less than 10% by weight passing the No. 200 sieve using ATM T-12. (For some materials it may be necessary to perform both ATM T-12 and WAQTC FOP for AASHTO T 99/T 180/WAQTC TM 9, in which case the highest maximum dry density is used.) For materials with greater than 80% by weight passing the No. 4 sieve, WAQTC FOP for AASHTO T 99/T 180/WAQTC TM 9, Method A with the plus No. 4 material removed and treated as oversize will be used. WAQTC FOP for AASHTO T 99/T 180/WAQTC TM 9, Method D will be used for materials with greater than 60% by weight passing the ¾ inch sieve with the plus ¾ inch material removed and treated as oversize.

WAQTC FOP for AASHTO T 99/T 180/WAQTC TM 9 will be performed according to Note 7 (the 12 hour stand time may be waived if the sample has not been dried to less than four percentage points below the optimum moisture content) and modified so that the moisture content of each trial is determined from the complete specimen and reported to the nearest 0.1%. Section 13 is modified to include: 13.1.6 Bulk Specific Gravity of the oversize material; 13.1.7 Apparent

Specific Gravity of the tested material minus the oversize; and 13.1.8 Zero Air Voids Curve calculated and plotted in accordance with ASTM D 1557, Sections 11.2 and 11.5.

(11/05/02) R193USC02

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.

(11/05/02)R176USC02

301-3.01 PLACING.

Add the following:

Base course material used for the sidewalk and pathway foundation shall be placed with a "Layton box" or similar equipment capable of providing a specified depth with a uniform surface.

(9/1/89) R26

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 based upon a roller pattern. The roller pattern shall be determined by a test strip using 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:

If recycled asphalt material is substituted for aggregate base course, it will be paid for as Item 301(1), Aggregate Base Course at the unit price shown on the bid schedule for that item.

(11/05/02) R176USC02

SECTION 401

ASPHALT CONCRETE PAVEMENT

Special Provisions

Delete this Section in its entirety and substitute the following:

401-1.01 DESCRIPTION. Construct one or more layers of plant-mixed hot asphalt concrete pavement on an approved surface, to the lines, grades, and depths shown on the Plans. This work also includes cleaning and sealing cracks, patching pavement breakthrough areas and installing a leveling course.

MATERIALS

401-2.01 COMPOSITION OF MIXTURE - JOB MIX DESIGN. Meet the requirements of Table 401-1 for the Job Mix Design performed in accordance with ATM 417.

TABLE 401-1
ASPHALT CONCRETE MIX DESIGN REQUIREMENTS

DESIGN PARAMETERS	CLASS "A"	CLASS "B"
Stability, pounds	1800 min.	1200 min.
Flow, 0.01 inch	8-14	8-16
Voids in Total Mix, %	3-5	3-5
Compaction, number of blows each side of test specimen	75	50
Percent Voids Filled with Asphalt (VFA)	65-75	65-78
Asphalt Content, min. %	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

* Dust-asphalt ratio is the percent of material passing the No. 200 sieve divided by the percent of effective asphalt (calculated by weight of mix).

The approved Job Mix Design will specify the target values for gradation, the target value for asphalt cement content, the Maximum Specific Gravity (MSG) of the mix, the additives, and the allowable mixing temperature range.

Target values for gradation in the Job Mix Design must be within the broad band limits shown in Table 703-3, for the type of asphalt concrete pavement specified but asphalt concrete mixture will have the full tolerances in Table 401-2 applied for evaluation in accordance with 401-4.03 except the tolerances for the largest sieve specified will be plus 0% and minus 1%, and the #200 sieve is limited by the broad band limits.

Do not produce asphalt concrete mixture for payment until the Engineer approves the Job Mix Design. Do not mix asphalt concrete mixtures produced from different plants.

Use Asphalt Concrete Type II, Class B, minimum, for temporary pavement.

Submit the following to the Engineer at least 15 days before the production of asphalt concrete mixture:

1. A letter stating the location, size, and type of mixing plant, the proposed gradation for the Job Mix Design, gradations for individual stockpiles with supporting process quality control information, and the blend ratio of each aggregate stockpile. The proposed gradation must meet the requirements of Table 703-3 for each type of asphalt concrete pavement specified in the Contract.

2. Representative samples of each aggregate (coarse and/or intermediate, fine, and natural blend material) in the proportions required for the proposed mix design. Furnish a total of 500 pounds of material.

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

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 Material Safety Data Sheet.

The Engineer will then evaluate the material and the proposed gradation using ATM 417 and the requirements of Table 401-1 for the appropriate type and class of asphalt concrete pavement specified and then establish the approved Job Mix Design which will become a part of the Contract.

The Engineer will assess a fee of $2,500.00 under Item 401(6), Asphalt Price Adjustment, for each mix design subsequent to the approved Job Mix Design for each Type and Class of Asphalt Concrete Pavement specified.

No payment for asphalt concrete pavement for which a new Job Mix Design is required will be made until the new Job Mix Design is approved. Approved changes apply only to asphalt concrete mixture produced after the submittal of the changes.

Changes. Failure to achieve results conforming to Table 401-1 or changes in the source of asphalt cement, source of aggregates, aggregate quality, aggregate gradation, or blend ratio, will require a new Job Mix Design. Submit changes and new samples in the same manner as the original submittal.

401-2.02 AGGREGATES. Conform to Subsection 703-2.04.

Use a minimum of three stockpiles for crushed asphalt concrete aggregate (coarse, intermediate, and fine). Place blend material in a separate pile.

401-2.03 ASPHALT CEMENT. Provide the grade of asphalt cement specified in the Contract meeting the applicable requirements of Section 702. If not specified, use PG 52-28.

Provide test reports for each batch of asphalt cement showing conformance to the specifications in Section 702 prior to delivery to the project. Document the storage tanks used for each batch 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 cement 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 (106-1.05).
2. Conformance test reports for the batch (Section 702).
3. Batch number and storage tanks used.
4. Date and time of load out for delivery.
5. Type, grade, temperature, and quantity of asphalt cement loaded.
6. Type and percent of anti-strip added.

401-2.04 ANTI-STRIP ADDITIVES. Use anti-strip agents in the proportions determined by ATM 414 and included in the approved Job Mix Design. At least 70% of the aggregate must remain coated when tested according to ATM 414.

401-2.05 PROCESS QUALITY CONTROL. Sample and test materials for quality control of the asphalt concrete mixture according to Subsection 106-1.03. Provide copies of these test results to the Engineer within 24 hours.

Failure to perform quality control forfeits your right to a retest under Subsection 401-4.02.

Submit a paving and plant control plan at the pre-paving meeting to be held a minimum of 5 working days before initiating paving operations. Address the sequence of operations and joint construction. Outline steps to assure product consistency, to minimize segregation, and to prevent premature cooling of the asphalt concrete mixture. Include a proposed quality control testing frequency for gradation, asphalt cement content, and compaction.

CONSTRUCTION REQUIREMENTS

401-3.01 WEATHER LIMITATIONS. Do not place the asphalt concrete mixture on a wet surface, on an unstable/yielding roadbed, when the base material is frozen, or when weather conditions prevent proper handling or compaction of the mix. Do not place asphalt concrete mixture unless the roadway surface temperature is 40 °F or warmer.

401-3.02 EQUIPMENT, GENERAL. Use equipment in good working order and free of asphalt concrete mixture buildup. Make all equipment available for inspection and demonstration of operation a minimum of 24 hours before placement of asphalt concrete mixture.

401-3.03 ASPHALT MIXING PLANT. Meet AASHTO M 156. Use an asphalt plant designed to dry aggregates, maintain accurate temperature control, and accurately proportion asphalt cement and aggregates. Calibrate the asphalt plant and furnish copies of the calibration data to the Engineer at least 4 hours before asphalt concrete mixture production.

Provide a scalping screen at the asphalt plant to prevent oversize material or debris from being incorporated into the asphalt concrete mixture.
Provide a tap on the asphalt cement supply line just before it enters the plant (after the 3-way valve) for sampling asphalt cement.

401-3.04 HAULING EQUIPMENT. Haul asphalt mixtures 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.

Cover the asphalt concrete mixture in the hauling vehicle, when directed.

401-3.05 ASPHALT PAVERS. Use self-propelled pavers equipped with a heated vibratory screed. Control grade and cross slope with automatic grade and slope control devices. Use a 30-foot minimum ski, or other approved grade follower, to automatically actuate the paver screed 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 screed assembly that produces a finished surface of the required smoothness, thickness and texture without tearing, shoving or displacing the asphalt concrete mixture. 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 the segregation of the coarse aggregate particles from the remainder of the bituminous plant mix when that mix is carried from the paver hopper back to the paver augers. The means and methods used shall be approved by the paver manufacturer and may consist of chain curtains, deflector plates, or other such devices and any combination of these.

The following specific requirements apply to the identified bituminous pavers:

(1) Blaw-Knox bituminous pavers shall be equipped with the Blaw-Knox Materials Management Kit (MMK).
(2) Cedarapids bituminous pavers must have been manufactured in 1989 or later.
(3) Caterpillar bituminous pavers shall be equipped with deflector plates as identified in the December 2000 Service Magazine – entitled: New Asphalt Deflector Kit {6630, 6631, 6640}.

The Contractor shall supply a Certificate of Compliance that verifies the required means and methods used to prevent bituminous paver segregation have been implemented.

The Engineer shall approve all means and methods used to prevent bituminous paver segregation before the bituminous paver is used to place bituminous plant mix on the project.

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

401-3.06 ROLLERS. Use both steel-wheel (static or vibratory) and pneumatic-tire rollers. Operate rollers according to manufacturer's instructions. Avoid crushing or fracturing of aggregate. Use rollers designed to compact hot asphalt concrete mixtures and reverse without backlash.

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

401-3.07 PREPARATION OF EXISTING SURFACE. Prepare existing surfaces in conformance with the Plans and Specifications. Clean out loose material from cracks in existing pavement wider than 1 inch in width full depth then fill using asphalt concrete tamp in place. Clean, wash, and sweep existing paved surfaces of loose material.

After planing,

- Clean out loose material from cracks greater than 1 inch (+1 inch) in width full depth then fill using Asphalt Concrete tamp in place.

- Prelevel remaining ruts, pavement delaminations, or depressions having a depth greater than ½-inch with Asphalt Concrete, Type IV. No density testing is required for the leveling course material. The Engineer will inspect and accept this material.

- If planing breaks through existing pavement remove 2 inches of existing base and fill with Asphalt Concrete, Type II. Notify the Engineer of pavement areas that might be considered thin or unstable during pavement removal.

Existing surface must be approved by the Engineer before applying tack coat.

Prior to placing the asphalt concrete mixture, uniformly coat contact surfaces of curbing, gutters, sawcut pavement, cold joints, manholes, and other structures with tack coat material meeting Section 402.

Allow prime coat to cure and emulsion tack coat to break before placement of asphalt concrete mixture on these surfaces.

401-3.08 PREPARATION OF ASPHALT. Provide a continuous supply of asphalt cement to the asphalt mixing plant at a uniform temperature, within the allowable mixing temperature range.

401-3.09 PREPARATION OF AGGREGATES. Dry the aggregate so the moisture content of the asphalt concrete mixture, sampled at the point of acceptance for asphalt cement content, does not exceed 0.5% (by total weight of mix), as determined by WAQTC TM 6.

Heat the aggregate for the asphalt concrete mixture to a temperature specified in the mix design.

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

401-3.10 MIXING. Combine the aggregate, asphalt cement and additives in the mixer in the amounts required by the Job Mix Design. Mix to obtain 98% coated particles when tested according to AASHTO T 195.

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

Mix the asphalt concrete mixture within the temperature range determined by the Job Mix Design.

401-3.11 TEMPORARY STORAGE. Silo type storage bins may be used, provided that the characteristics of the asphalt concrete mixture are not altered. Signs of visible segregation, heat loss, changes from the Job Mix Design, change in the characteristics of asphalt cement, lumpiness, or stiffness of the mixture are causes for rejection.

401-3.12 PLACING AND SPREADING. Place the asphalt concrete mixture upon the approved surface, spread, strike off, and adjust surface irregularities. Use asphalt pavers to distribute asphalt concrete mixture, including leveling courses. The maximum compacted lift thickness allowed is 3 inches.

Use hand tools to spread, rake, and lute the asphalt concrete mixture 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.

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

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

401-3.13 COMPACTION. Thoroughly and uniformly compact the asphalt concrete mixture by rolling. In areas not accessible to large rollers, compact with mechanical tampers or trench rollers. Compact Type IV asphalt concrete pavement prelevel used to fill ruts with a pneumatic roller.

During placement of asphalt concrete the Engineer may evaluate the HMA immediately behind the paver for cyclic low density using an infrared camera. ***deleted text*** If there is a temperature differential that exceeds 25° F within the newly placed mat, low density is likely to occur. The real time thermal images and thermal profile data will become part of the project records shared with the Contractor. The Contractor shall immediately adjust his laydown procedures to correct the problem. **If the Engineer observes areas in any given pay sublot where the thermal images indicate cyclic low density is probable, he will order those areas to be cored for determination of density. These cores will be evaluated under Subsection 401-4.02 and 401-4.03.**

The target value for density is 94% of the maximum specific gravity (MSG), as determined by WAQTC FOP for AASHTO T 209. For the first lot of each type of asphalt concrete pavement, the MSG will be determined by the Job Mix Design. For additional lots, the MSG will be determined by the sample from the first sublot of each lot.

Acceptance testing for density will be performed in accordance with WAQTC FOP for AASHTO T 166/T 275 using a 6-inch diameter core. (Acceptance testing for density of leveling course or temporary pavement is not required.)

Do not leave rollers or other equipment standing on pavement that has not cooled sufficiently to prevent indentation.

401-3.14 JOINTS. Minimize the number of joints to ensure a continuous bond, texture, and smoothness between adjacent sections of the pavement.

Remove to full depth improperly formed joints resulting in surface irregularities. Replace with new, and thoroughly compact.

Precut all pavement removal to a neat line with a power saw or by other approved method.

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

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.

For the top layer of asphalt concrete pavement, the minimum specification limit for longitudinal joint density is 91% of the MSG of the panel completing the joint. Cut one 6 inch diameter core centered on the longitudinal joint at each location the panel completing the joint is cored for acceptance density testing. Density will be determined in accordance with WAQTC FOP for AASHTO T 166/T 275.

Seal the pavement surface 12 inches on each side of all the longitudinal joints while the pavement is clean, free of moisture, and before traffic marking with GSB-78 (from Asphalt Systems), or approved equal.

401-3.15 SURFACE TOLERANCE. The Engineer will test the finished surface after final rolling at selected locations using a 16-foot straightedge. Correct variations from the testing edge, between any two contacts of more than 3/16 inch.

401-3.16 PATCHING DEFECTIVE AREAS. Remove any asphalt concrete mixture that becomes contaminated with foreign material, is segregated, or is in any way determined to be defective. Do not skin patch. Remove defective materials for the full thickness of the course. Cut the pavement so that all edges are vertical, the sides are parallel to the direction of traffic and the ends are skewed between 15-25 degrees. Coat edges with a tack coat meeting Section 402 and allow to cure. Place and compact fresh asphalt concrete mixture per Subsection 401-3.13 to grade and smoothness requirements.

All costs associated with patching defective areas are subsidiary to the Asphalt Concrete pay item.

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

Asphalt Concrete. By weighing, no deduction will be made for the weight of asphalt cement or anti-stripping additive, or by the area of final pavement surface.

Asphalt Price Adjustment. Calculated by quality level analysis under Subsection 401-4.03.

Asphalt Cement. By the ton, as follows. Method 1 will be used for determining asphalt 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 cement more than 0.4% above the optimum asphalt content specified in the Job Mix Design.

1. Percent of asphalt cement for each sublot multiplied by the total weight represented by that sublot. Percent of asphalt cement will be determined by ATM 405 or WAQTC FOP for AASHTO T 308. The same tests used for the acceptance testing of the sublot will be used for computation of the asphalt cement quantity. If no acceptance testing is required, the percent of asphalt cement is the target value for asphalt cement in the Job Mix Design.

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 asphalt concrete mixture for one project only.

   The Engineer may direct at any time that tankers be weighed in the Engineers 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 cement. The Engineer will determine the method. The weight of asphalt cement in waste asphalt concrete mixture will be calculated using the target value for asphalt cement as specified in the Job Mix Design.

401-4.02 ACCEPTANCE SAMPLING AND TESTING. The quantity of each type of asphalt concrete mixture produced and placed will be divided into lots and the lots evaluated individually for acceptance.

A lot will normally be 5,000 tons. The lot will be divided into sublots of 500 tons, each randomly sampled and tested for asphalt cement content, density, and gradation according to this Subsection. If the project has more than 1 lot, and less than 8 additional sublots have been sampled at the time a lot is terminated, either due to completion of paving operations or the end of the construction season (winter shutdown), the material in the shortened lot will be included as part of the prior lot. The price adjustment computed, according to Subsection 401-4.03, for the prior lot will include the samples from the shortened lot.

If 8 or 9 samples have been obtained 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 (excluding outliers) in the shortened lot.

If the contract quantity is between 1,500 tons and 4,999 tons, the contract quantity will be considered one lot. The lot will be divided into sublots of 500 tons and randomly sampled for asphalt cement content, density, and gradation according to this Subsection. Hot mix asphalt quantities of less than 300 tons remaining after dividing the lot into sublots will be included in the last sublot, hot mix asphalt quantities of 300 tons or greater will be treated as an individual sublot. The lot will be evaluated for price adjustment according to Subsection 401-4.03 except as noted.

For contract quantity of less than 1,500 tons (and for temporary pavement), hot mix asphalt will be accepted for payment based on the Engineer's approval of a Job Mix Design and the placement and compaction of the hot mix asphalt to the specified depth and finished surface require-

ments and tolerances. Remove and replace any hot mix asphalt that does not conform to the approved JMD.

Any area of finished surfacing that is visibly segregated, fails to meet surface tolerance requirements is considered unacceptable per Subsection 105-1.11.

1. Asphalt Cement. Samples for the determination of asphalt cement content will be taken from either the windrow in front of the paver, or at the end of the auger, or behind the screed prior to initial compaction. Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if applicable. At the discretion of the Engineer, asphalt cement content will be determined in accordance with ATM 405 or WAQTC FOP for AASHTO T 308.

2. Asphalt Cement Quality. The Contractor shall sample asphalt cement from the asphalt cement supply line when requested, witnessed by the Engineer's representative. After purging residual asphalt cement, take 3 one-quart samples into wide mouth one-quart metal containers. Asphalt cement will be sampled for acceptance testing in accordance with WAQTC FOP for AASHTO T 40 and tested for conformance to the specifications in Section 702. Three separate samples will be taken, one for acceptance testing, one for Contractor retesting, and one held in reserve for referee testing.

3. Aggregate Gradation.

   a. Drum Mix Plants. Samples taken for the determination of aggregate gradation from drum mix plants will be from the combined aggregate cold feed conveyor via a diverter device, from the stopped conveyor belt or from the same location as samples for the determination of asphalt cement content. Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if applicable. The aggregate gradation for samples from the conveyor system will be determined in accordance with WAQTC FOP for AASHTO T 27/T 11. For asphalt concrete mixture samples, the gradation will be determined in accordance with WAQTC FOP for AASHTO T 30 from the aggregate remaining after the ignition oven (WAQTC FOP for AASHTO T 308) has burned off the asphalt cement. 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 asphalt concrete mixture.

   b. Batch Plants. Samples taken for the determination of aggregate gradation from batch plants will be from the same location as samples for the determination of asphalt cement content, or from dry batched aggregates. Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if applicable. Dry batched aggregate gradations will be determined in accordance with WAQTC FOP for AASHTO T 27/T 11. For asphalt concrete mixture samples, the aggregate gradation will be determined in ac-

cordance with WAQTC FOP for AASHTO T 30 from the aggregate remaining after the ignition oven (WAQTC FOP for AASHTO T 308) has burned off the asphalt cement.

4. Density. Cut full depth core samples from the finished asphalt concrete pavement within 24 hours after final rolling. Neatly cut one 6-inch diameter core sample with a core drill from each sublot at the randomly selected location marked by the Engineer. Use a core extractor to prevent damage to the core. The Engineer will determine the density of the core samples in accordance with WAQTC FOP for AASHTO T 166/T 275. Do not core asphalt concrete pavement on bridge decks. Backfill and compact all voids left by coring with new asphalt concrete mixture within 24 hours.

   Failure to cut core samples within the specified period will result in a deduction of $100.00 per sample per day. Failure to backfill voids left by sampling within the specified period will result in a deduction of $100.00 per hole per day. The accrued amount will be subtracted under Item 401(6), Asphalt Price Adjustment.

5. Retesting. A retest of any sample outside the limits specified in Table 401-2 may be requested provided the quality control requirements of 401-2.05 are met. Deliver this request in writing to the Engineer within 7 days of receipt of the initial test result. The Engineer will mark the sample location for the density retest. The original test results for gradation, asphalt cement content, or density will be discarded and the retest result will be 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. Except for the first lot, gradation or asphalt cement content retesting of the sample from the first sublot of a lot will include retesting for the MSG.

401-4.03 EVALUATION OF MATERIALS FOR ACCEPTANCE. The following method of price adjustment will be applied to each type of Asphalt Concrete Pavement for which the contract quantity equals or exceeds 1,500 tons, except as specified in Subsection 401-4.02.

Acceptance test results for a lot will be analyzed collectively and statistically by the Quality Level Analysis method as specified in Subsection 106-1.03 to determine the total estimated percent of the lot that is within specification limits. Asphalt cement content results will be reported to the nearest 0.1 percent.

The price adjustment is based on the lower of two pay factors. The first factor is a composite pay factor for asphalt concrete mixture, which includes gradation and asphalt cement content. The second factor is for density.

A lot containing asphalt concrete pavement with less than a 1.00 pay factor will be accepted at an adjusted price, provided the pay factor is at least 0.75 and there are no isolated defects identified by the Engineer. A lot containing asphalt concrete pavement that fails to obtain at least a 0.75 pay factor will be considered unacceptable and rejected under Subsection 105-1.11.

The Engineer will reject asphalt concrete mixture that appears to be defective based on visual inspection. A minimum of two samples will be collected from the rejected mixture and tested if requested. If all test results are within specification limits, payment will be made for the mixture. If any of the test results fail to meet specifications, no payment will be made and the cost of the testing will be subtracted under Item 401(6), Asphalt Price Adjustment. All costs associated with removal and disposal of the rejected asphalt concrete mixture are subsidiary to the Asphalt Concrete pay item.

Outlier Test. Before computing the price adjustment, the validity of the test results will be determined by SP-7, the Standard Practice for Determination of Outlier Test Results. Outlier test results will not be included in the price adjustment calculations.

If any sieve size on a gradation test or the asphalt cement content is an outlier, then the gradation test results and the asphalt cement content results for that sublot will not be included in the price adjustment. The density test result for that sublot will be included in the price adjustment provided it is not an outlier.

If the density test result is an outlier, the density test result will not be included in the price adjustment, however, the gradation and asphalt cement content results for that sublot will be included provided neither is an outlier.

Quality Level Analysis. Pay factors are computed as follows:

1. Outliers (determined by SP-7), and any test results on material not incorporated into the work, are eliminated from the quality level analysis.

   The arithmetic mean ($\bar{x}$) of the remaining test results is determined: $\bar{x} = \frac{\Sigma x}{n}$

   Where: Σ = summation of
   x = individual test value to x_n
   n = total number of test values

   $\bar{x}$ is rounded to the nearest tenth for density and all sieve sizes except the No. 200 sieve.
   $\bar{x}$ is rounded to the nearest hundredth for asphalt cement content and the No. 200 sieve.

2. The sample standard deviation(s), after the outliers have been excluded, is computed:

$$s = \sqrt{\frac{n\Sigma(x^2) - (\Sigma x)^2}{n(n-1)}}$$

   Where: $\Sigma (x^2)$ = sum of the squares of individual test values.
   $(\Sigma x)^2$ = square of the sum of the individual test values.

   The sample standard deviation (s) is rounded to the nearest hundredth for density and all sieve sizes except the No. 200 sieve. The sample standard deviation (s) is rounded to the nearest 0.001 for asphalt cement content and the No. 200 sieve.

If the computed sample standard deviation (s) is <0.001, then use s = 0.20 for density and all sieves except the No. 200. Use s = 0.020 for asphalt cement content and the No. 200 sieve.

3. The USL and LSL are computed. For aggregate gradation and asphalt cement content, the Specification Limits (USL and LSL) are equal to the Target Value (TV) plus and minus the allowable tolerances in Table 401-2. The TV is the specification value specified in the approved Job Mix Design. Specification tolerance limits for the largest sieve specified will be plus 0 and minus 1 for Quality Level Analysis purposes. The TV for density is 94% of the maximum specific gravity (MSG), the LSL is 92% of MSG and the USL is 98%.

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

Measured Characteristics	LSL	USL
3/4 inch sieve	TV-6.0	TV+6.0
1/2 inch sieve	TV-6.0	TV+6.0
3/8 inch sieve	TV-6.0	TV+6.0
No. 4 sieve	TV-6.0	TV+6.0
No. 8 sieve	TV-6.0	TV+6.0
No. 16 sieve	TV-5.0	TV+5.0
No. 30 sieve	TV-4.0	TV+4.0
No. 50 sieve	TV-4.0	TV+4.0
No. 100 sieve	TV-3.0	TV+3.0
No. 200 sieve[1]	TV-2.0	TV+2.0
Asphalt %	TV-0.4	TV+0.4
Density %	92	98

Note 1. Tolerances for the No. 200 sieve may not exceed the broad band limits in Table 703-3.

4. The Upper Quality Index (Q_U) is computed: $Q_U = \frac{USL - \bar{x}}{s}$

   Where: USL = Upper Specification Limit
   Q_U is rounded to the nearest hundredth.

5. The Lower Quality Index (Q_L) is computed: $Q_L = \frac{\bar{x} - LSL}{s}$

   Where: LSL = Lower Specification Limit
   Q_L is rounded to the nearest hundredth.

6. P_U (percent within the upper specification limit which corresponds to a given Q_U) is determined. See Subsection 106-1.03.

7. P_L (percent within the lower specification limit which corresponds to a given Q_L) is determined. See Subsection 106-1.03.

8. The Quality Level (the total percent within specification limits) is determined for aggregate gradation, asphalt cement content, and density.

$$\text{Quality Level} = (P_L + P_U) - 100$$

9. Using the Quality Levels from Step 8, the lot Pay Factor is determined for Density (DPF) and gradation and asphalt cement content pay factors (PF) from Table 106-2. The maximum pay factor for the largest sieve size specification for gradation is 1.00.

10. The Composite Pay Factor (CPF) for the lot is determined using the following formula:

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

The CPF is rounded to the nearest hundredth.

Table 401-3 gives the weight factor (f) for each sieve size and asphalt cement content.

TABLE 401-3
WEIGHT FACTORS

Gradation	Factor "f"
3/4 inch sieve	4
1/2 inch sieve	5
3/8 inch sieve	5
No. 4 sieve	4
No. 8 sieve	4
No. 16 sieve	4
No. 30 sieve	5
No. 50 sieve	5
No. 100 sieve	4
No. 200 sieve	20
Asphalt %	40

The price adjustment will be based on either the CPF or DPF, whichever is the lowest value. The price adjustment for each individual lot will be calculated as follows:

Price Adjustment = [(CPF or DPF)* -1.00] x (tons in lot) x (PAB)

* CPF or DPF, whichever is lower.

PAB = Price Adjustment Base = $65 per ton

EVALUATION OF ASPHALT CEMENT

Asphalt cement will be randomly sampled and tested every 200 tons and evaluated for price adjustment. If the last sample increment is 100 tons or less, that quantity of asphalt cement will be added to the quantity represented by the previous sample and the total quantity will be evaluated for price adjustment. If the last sample increment is greater than 100 tons, it will be sampled, tested and evaluated separately. Asphalt cement pay reduction factors for each sample will be determined from Table 401-4.

The total asphalt cement price adjustment is the sum of the individual sample price adjustments and will be subtracted under Item 401(6), Asphalt Price Adjustment.

(11/18/04)R&M

Table 401-4
ASPHALT CEMENT PAY REDUCTION FACTORS
(Use the single, highest pay reduction factor)

	(i) Spec	Pay Reduction Factor (PRF)								
		0	**0.04**	**0.05**	**0.06**	**0.07**	**0.08**	**0.1**	**0.25**	**Reject or Engr Eval**
1) Tests On Original Binder										
Viscosity	<3 Pa-s	≤3		>3						
Dynamic Shear	>1.00 kPa	>1.00		0.99-0.88				0.87-0.71	0.70-0.50	<0.50
Toughness	>110 in-lbs	>93.5	90.0-93.4	85.0-89.9	80.0-84.9	75.0-79.9	70.0-74.9			<70.0
Tenacity	>75 in-lbs	>63.8	61.0-63.7	58.0-60.9	55.0-57.9	52.0-54.9	48.0-51.9			<48.0
2) Tests On RTFO										
Mass Loss	<1.00 %	<1.00		1.001-1.092				1.093-1.184	1.185-1.276	>1.076
Dynamic Shear	>2.20 kPa	>2.20		2.199-1.816				1.815-1.432	1.431-1.048	<1.048
3) Test On PAV										
Dynamic Shear	<5000 kPa	<5000		5001-5289				5290-5578	5579-5867	>5867
Creep Stiffness, S	<300 MPa	<300		301-338				339-388	389-450	>450
Creep Stiffness, m-value	>0.300	>0.300		0.299-0.287				0.286-0.274	0.273-0.261	<0.261
Direct Tension	>1.0 %	>1.0		0.99-0.86				0.85-0.71	0.70-0.56	<0.56

Asphalt Cement Price Adjustment for each sample = 5 x PAB x Qty X PRF
PAB = Price Adjustment Base
Qty = Quantity of asphalt cement represented by asphalt cement sample
PRF = Pay Reduction Factor from Table 401-4

Asphalt Cement Appeal Procedure. Once notified of a failing test result of an asphalt cement sample, the Contractor has 21 days to issue a written appeal. The appeal must be accompanied by all of the Contactor's quality control test results and a test result of Contactor's sample of this lot tested by an AASHTO accredited asphalt laboratory (accredited in the test procedure in question). The Engineer will review these test results and using ASTM D3244 determine a test value upon which to base a price reduction.

If the Contractor challenges this value, then the referee sample held by the Engineer will be sent to a mutually agreed upon independent AASHTO accredited laboratory for testing. This test result will be incorporated into the ASTM D3244 procedure to determine a test value upon which to base a price reduction. If this final value incurs a price adjustment, the Contractor under Item 408(3), Asphalt Price Adjustment, shall pay the cost of testing the referee sample.

The total Asphalt Price Adjustment is the sum of all the price adjustments for each lot.

401-5.01 BASIS OF PAYMENT.

Separate payment will not be made for asphalt cement or anti-strip additives for asphalt concrete for leveling course.

Asphalt cement, anti-stripping additives, tack coat, and crack sealing are subsidiary to the asphalt concrete pavement unless specified as pay items.

Price adjustments will not apply to Asphalt Concrete Mixture for leveling course

Payment will be made under:

Pay Item	Pay Unit
401(1A) Asphalt Concrete, Type II; Class A	Ton
401(2) Asphalt Cement, Grade PG 52-28	Ton
401(6) Asphalt Price Adjustment	Contingent Sum
401(11) Repair of +1 Inch Crack	Linear Foot
401(12) Repair-Leveling Course (Type IV, Class A)	Lane-Station

Add the following Section:

SECTION 408

ASPHALT CONCRETE PAVEMENT

Special Provisions

408-1.01 DESCRIPTION. Construct one or more layers of plant-mixed hot asphalt concrete pavement on an approved surface, to the lines, grades, and depths shown on the Plans. Superpave mix design procedures will be used to design the mix.

Hard aggregates are required for asphalt concrete pavement specified for portions of this project. See Subsection 703-2.04.

408-2.01 COMPOSITION OF MIXTURE - JOB MIX DESIGN. The Job Mix Design will be developed using Asphalt Institute's Superpave Mix Design SP-2 and also meet the requirements of Table 408-1, Table 408-2, and SP-2 TABLE 5.1 and TABLE 5.2. Evaluation of moisture sensitivity by AASHTO T 283 will not be part of the mix design process.

TABLE 408-1
Asphalt Concrete Mix Design Requirements

Design ESALs, millions	0.3 to < 3
Nom. Max Aggr. Size	¾"
Rut Index, max.	3

The approved Job Mix Design will specify the target values for gradation, the target value for asphalt cement content, the Maximum Specific Gravity (MSG) of the mix, the additives, and the allowable mixing temperature range.

Target values for gradation in the Job Mix Design must be within the broad band limits shown in Table 703-3, for the type of asphalt concrete pavement specified but asphalt concrete mixture will have the full tolerances in Table 408-2 applied for evaluation in accordance with 408-4.03 except for the following:

- Tolerances for the largest sieve specified will be plus 0% and minus 1%.
- Tolerances for the No. 200 or 0.075mm sieve may not exceed the broad band limits.

Do not produce asphalt concrete mixture for payment until the Engineer approves the Job Mix Design. Do not mix asphalt concrete mixtures produced from different plants.

Submit the following to the Engineer at least 15 days before the production of asphalt concrete mixture:

1. A letter stating the location, size, and type of mixing plant, the proposed gradation for the Job Mix Design, gradations for individual stockpiles with supporting process quality control information, and the blend ratio of each aggregate stockpile. The proposed gradation must meet the requirements of Table 703-3.

2. Representative samples of each aggregate (crushed coarse, crushed intermediate, crushed fine, and natural blend material) in the proportions required for the proposed mix design. Furnish a total of 500 pounds of material.

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

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 Material Safety Data Sheet.

From this material, the Engineer will develop the Job Mix Design using procedures in SP-2. Approved Job Mix Designs will become a part of the contract. Up to15 working days may be required to determine the Job Mix Design after receipt of all items specified above.

Changes in the source of asphalt cement, source of aggregates, aggregate quality, aggregate gradation changes from Job Mix, or blend ratio requires a new Job Mix Design. The Contractor must provide submittals and materials to create a new job mix design. Approved changes to a previously approved mix design may only be initialized after a lot is completed using the previous mix design.

The Engineer will assess a mix design fee of $3,600.00 under Item 408(3), Asphalt Price Adjustment for each mix design subsequent to the first approved Job Mix Design.

408-2.02 AGGREGATES. Conform to Subsection 703-2.04.

Remove all natural fines passing a #4 sieve before crushing aggregates for asphalt concrete mixtures. Divide the crushed aggregate into a minimum of 3 stockpiles; coarse, intermediate, and fine. Additional stockpiles may be required for some material sources to create a Design Aggregate Structure that meets the volumetric requirements of the mix design procedures.

408-2.03 ASPHALT MATERIALS. Conform to Subsection 702-2.01, PG 64-28. No binder grade adjustment will be made for traffic load rate.

Each batch of asphalt cement shall be tested for conformance to specifications in Section 702 prior to shipping. Storage tanks used for the batch shall be noted on the test report. Anti-strip additives required by the mix design shall be added to the asphalt cement during load out for delivery to the project. A printed weight ticket of antistrip shall be included with the asphalt cement delivery ticket. The location where antistrip is added may be changed with the approval of the Engineer.

Shipping documents shall include the following:

1. Manufacturers certificate of compliance, Subsection 106-1.05
2. Conformance test results of the batch, Section 702.
3. Date and Time of loading
4. Batch number and storage tank
5. Type, grade, temperature, and quantity of materials loaded
6. Type and percent of anti-strip added.

408-2.04 ANTI-STRIP ADDITIVES. Use anti-strip agents in the proportions determined by ATM T-414 and included in the approved Job Mix Design. At least 70 percent of the aggregate shall remain coated when tested in accordance with ATM T-414. Anti-stripping additive shall be furnished in the minimum amount of 0.25 percent per ton of asphalt cement.

408-2.05 QUALITY CONTROL. Sample and test materials for quality control of the asphalt concrete mixture according to Subsection 106-1.03. Provide copies of these test results to the Engineer within 24 hours.

Failure to perform quality control forfeits the Contractor's right to retest as provided for in Subsection 408-4.02.

A paving and plant control plan shall be submitted at least 3 working days before the pre-paving meeting. The paving and plant control plan shall address sequence of operations, joint construction and sealing, outline steps to assure product consistency, to minimize segregation, and to prevent premature cooling of the asphalt concrete mixture. The plan shall also include a proposed testing frequency for gradation, asphalt cement content and compaction and shall include temperatures for bituminous mixture and materials. The pre-paving meeting shall be held on-site with the Engineer at least 2 days before paving begins, and shall include the Contractor's superintendent, paving foreman, asphalt plant operator, and quality control person.

CONSTRUCTION REQUIREMENTS

408-3.01 WEATHER LIMITATIONS. Do not place asphalt concrete mixture on a surface having greater than optimum moisture, on an unstable or yielding surface, or when the base material is frozen, or during detrimental weather conditions. Do not pave unless the roadway surface temperature is 40 °F or warmer.

408-3.02 EQUIPMENT, GENERAL. Use equipment in good working order and free of asphalt concrete mixture buildup. Make all equipment available for inspection and demonstration of operation a minimum of 24 hours before placement of asphalt concrete mix.

408-3.03 BITUMINOUS MIXING PLANTS. Meet AASHTO M156. Calibrate the asphalt plant and furnish calibration data to the Engineer at least one day prior to production. Maintain a current Air Quality Permit issued by the State Of Alaska.

Provide and maintain a functioning scalping screen on the asphalt plant to prevent oversize material or debris from being incorporated into the mixture. Provide a tap on the asphalt cement supply line just before it enters the plant (after the 3-way valve) for sampling asphalt cement.

Certify weigh silo scales if the weights from them are used for payment.

408-3.04 HAULING EQUIPMENT. Haul asphalt mixtures in trucks having tight, clean, smooth metal beds, thinly coated with a minimum amount of paraffin oil, lime water solution or other manufactured asphalt release agent included on the Department's Approved Products List. Do not use diesel fuel or fuel oil as an asphalt release agent.

Cover the asphalt mixture in the haul vehicle, when directed.

408-3.05 ASPHALT PAVERS. Use self-propelled asphalt pavers having a heated vibratory screed. Control with grade and cross slope using automatic grade and slope control devices. Use a paver screed control system that is automatically actuated by a ski least 30 feet in length, or other approved grade follower. 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 screed assembly that produces a finished surface of the required smoothness, thickness and texture without tearing, shoving or displacing the asphalt concrete mixture. Provide heaters and vibrators on the main screed and screed extensions. Maintain auger extensions within 1.5 feet of the end of the screed extension.

Equip the paver with a means of preventing the segregation of the coarse aggregate particles from the remainder of the bituminous plant mix when that mix is carried from the paver hopper back to the paver augers. The means and methods used shall be approved by the paver manufacturer and may consist of chain curtains, deflector plates, or other such devices and any combination of these.

The following specific requirements apply to the identified bituminous pavers:

(1) Blaw-Knox bituminous pavers shall be equipped with the Blaw-Knox Materials Management Kit (MMK).
(2) Cedarapids bituminous pavers must have been manufactured in 1989 or later.

(3) Caterpillar bituminous pavers shall be equipped with deflector plates as identified in the December 2000 Service Magazine – entitled: New Asphalt Deflector Kit {6630, 6631, 6640}.

The Contractor shall supply a Certificate of Compliance that verifies the required means and methods used to prevent bituminous paver segregation have been implemented.

The Engineer shall approve all means and methods used to prevent bituminous paver segregation before the bituminous paver is used to place bituminous plant mix on the project.

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

408-3.06 ROLLERS. Use both steel-wheel (static or vibratory) and pneumatic-tire rollers. Operate rollers according to manufacturer's instructions. Avoid crushing or fracturing of aggregate. Use rollers designed to compact hot asphalt concrete mixtures and reverse without backlash.

Use fully-skirted pneumatic-tire rollers having a minimum operating weight of 3000 pounds or 1400kg per tire.

408-3.07 PREPARATION OF EXISTING SURFACE. Prepare the existing surfaces in conformance with the plans and specifications. Clean out loose material from cracks in existing pavement wider than 1 inch in width, full depth then fill using asphalt concrete tamp in place.

Existing paved surfaces shall be cleaned of loose material by sweeping with a power broom, supplemented by hand sweeping, if necessary. Engineer must approve the surface before tack is applied.

Prior to placing the asphalt concrete mixture, uniformly coat contact surfaces of curbing, gutters, sawcut pavement, cold joints, manholes, and other structures with tack coat material per Section 402.

Allow prime coat to cure and emulsion tack coat to break before placement of asphalt concrete mixture on these surfaces.

408-3.08 PREPARATION OF ASPHALT. A continuous supply of asphalt cement shall be supplied to the mixer at a uniform temperature, within the allowable mixing temperature range noted in the approved mix design.

408-3.09 PREPARATION OF AGGREGATES. Dry the aggregate so the moisture content of the asphalt concrete mixture, sampled at the point of acceptance for asphalt cement content, does not exceed 0.5% (by total weight of mix), as determined by WAQTC TM 6.

Heat the aggregate for the asphalt concrete mixture to a temperature specified in the mix design.

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

408-3.10 MIXING. Combine the aggregate, asphalt cement and additives in the mixer in the amounts required by the Job Mix Design. Mix to obtain 98% coated particles when tested according to AASHTO T 195.

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

Mix the asphalt concrete mixture within the temperature range determined by the Job Mix Design.

408-3.11 TEMPORARY STORAGE OF ASPHALT CONCRETE MIXTURE. Silo type storage bins may be used, provided that the characteristics of the asphalt concrete mixture are not altered. Signs of visible segregation, heat loss, changes from the Job Mix Design, change in the characteristics of asphalt cement, lumpiness, or stiffness of the mixture are causes for rejection. Asphalt concrete mixtures shall not be stored or transported by barges.

408-3.12 PLACING AND SPREADING. Place the asphalt concrete mixture upon the approved surface, spread, strike off, and adjust surface irregularities. Use asphalt pavers to distribute asphalt concrete mixture, including leveling courses.

Use hand tools to spread, rake, and lute the asphalt concrete mixture 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.

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

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

Place asphalt concrete mixture over bridge deck membranes according to Section 508 and the manufacturer's specifications.

408-3.13 COMPACTION. Thoroughly and uniformly compact the asphalt concrete mixture by rolling. In areas not accessible to large rollers, compact with mechanical tampers or trench rollers.

During placement of asphalt concrete the Engineer will evaluate the HMA immediately behind the paver for cyclic low density using an infrared camera. * deleted text*

If there is a temperature differential that exceeds 25° F within the newly placed mat, low density is likely to occur. The real time thermal images and thermal profile data will become part of the project records shared with the Contractor. The Contractor shall immediately adjust his laydown procedures to correct the problem. If the Engineer observes four or more areas in any given pay lot where the thermal images indicate cyclic low density is probable, he will order those areas to be cored for determination of density. **These cores will be evaluated under Subsection 408-4.02 and 408-4.03.**

The target value for density is 94% of the maximum specific gravity (MSG), as determined by WAQTC FOP for AASHTO T 209. For the first lot of each type of asphalt concrete pavement, the MSG will be determined by the Job Mix Design. For additional lots, the MSG will be determined by the sample from the first sublot of each lot.

Acceptance testing for density will be performed in accordance with WAQTC FOP for AASHTO T 166/T 275 using a 6-inch diameter core. (Acceptance testing for density of leveling course or temporary pavement is not required.)

Do not leave rollers or other equipment standing on pavement that has not cooled sufficiently to prevent indentation.

408-3.14 JOINTS. Minimize the number of joints to ensure a continuous bond, texture, and smoothness between adjacent sections of the pavement. No quantity deduction will be made for materials removed for joint preparation.

Remove to full depth improperly formed joints resulting in surface irregularities. Replace with new asphalt concrete mixture, and thoroughly compact.

Precut all pavement removal to a neat line with a power saw or by other approved method.

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

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.

Seal the vertical edge in the longitudinal joints on the top pavement surface with Crafco 34524 Joint Adhesive or approved equal. Apply a 1/8 inch thick band of joint adhesive over the surface according to manufacturer's recommendations.

For the top layer of asphalt concrete pavement, the minimum specification limit for longitudinal joint density is 91% of the MSG of the panel completing the joint. Cut one 6 inch diameter core centered on the longitudinal joint at each location that the mat completing the joint is cored for

acceptance density testing. Density will be determined in accordance with WAQTC FOP for AASHTO T 166/T 275.

Seal the top pavement surface 12 inches on each side of all the longitudinal joints while the pavement is clean, free of moisture, and before traffic marking. Use GSB-78 (from Asphalt Systems), or approved equal.

408-3.15 SURFACE TOLERANCE. The Engineer will test the finished surface after final rolling at selected locations using a 16-foot straight edge. Correct variations from the testing edge, between any two contacts, greater than 3/16 inch.

The Engineer will measure the surface smoothness of the top layer of asphalt concrete pavement in the driving lanes with an inertial profiler before final acceptance of the project. Remove and replace, or grind smooth any area of final pavement surface that has a smoothness exceeding the straight edge tolerance. All costs associated with meeting surface tolerances are subsidiary to the Asphalt Concrete pay item.

After completion of corrective work, the Engineer will measure the pavement surface in the driving lanes a second time for a smoothness price adjustment. No measurements will be taken in turn lanes, lane transitions, or within 25 feet of previously existing pavement at the project beginning and end.

Smoothness will be measured in both wheel paths of each lane and reported as profilograph results (PrI) filtered with a 0.2 inch blanking band. Report PrI as a job average for all measured lanes, calculated to the nearest 0.1 inch.

408-3.16 PATCHING DEFECTIVE AREAS. Remove any asphalt concrete mixture that becomes contaminated with foreign material, is segregated, or is in any way determined to be defective. Do not skin patch. Remove defective materials for the full thickness of the course. Cut the pavement so that all edges are vertical, the sides are parallel to the direction of traffic and the ends are skewed between 15-25 degrees. Coat edges with a tack coat meeting Section 402 and allow to cure. Place and compact fresh asphalt concrete mixture per Subsection 408-3.13 to grade and smoothness requirements.

All costs associated with patching defective areas are subsidiary to the Asphalt Concrete pay item.

408-4.01 METHOD OF MEASUREMENT. Section 109 and the following:

Asphalt Concrete. Either by weighing, no deduction will be made for the weight of asphalt cement or anti-stripping additive, or by the area of final pavement surface.

Asphalt Price Adjustment. Calculated by quality level analysis under Subsection 408-4.03.

Asphalt Cement. By the ton, as follows. Method 1 will be used for determining asphalt 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 cement more than 0.4% above the optimum asphalt content specified in the Job Mix Design.

1. Percent of asphalt cement for each sublot multiplied by the total weight represented by that sublot. The percent of asphalt cement will be determined by ATM 405 or WAQTC FOP for AASHTO T 308. The same tests used for the acceptance testing of the sublot will be used for computation of the asphalt cement quantity. If no acceptance testing is required, the percent of asphalt cement is the target value for asphalt cement in the Job Mix Design.

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 asphalt concrete mixture for one project only.

   The Engineer may direct at any time that tankers be weighed in the Engineers 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 cement. The Engineer will determine the method. The weight of asphalt cement in waste asphalt concrete mixture will be calculated using the target value for asphalt cement as specified in the Job Mix Design.

Anti-Strip Additive. Subsidiary to and based on the weight of asphalt cement containing required additive.

Longitudinal Joint and Joint Adhesive. By the lineal foot of longitudinal joint.

408-4.02 ACCEPTANCE SAMPLING AND TESTING. The quantity of each type of asphalt concrete mixture produced and placed will be divided into lots and the lots evaluated individually for acceptance.

A lot will normally be 5,000 tons. The lot will be divided into sublots of 500 tons, each randomly sampled and tested for asphalt cement content, density, and gradation according to this Subsection. If the project has more than 1 lot, and less than 8 additional sublots have been sampled at the time a lot is terminated, either due to completion of paving operations or the end of the construction season (winter shutdown), the material in the shortened lot will be included as part of the prior lot. The price adjustment computed, according to Subsection 408-4.03, for the prior lot will include the samples from the shortened lot.

If 8 or 9 samples have been obtained 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 (excluding outliers) in the shortened lot.

If the contract quantity is between 1,500 tons and 5000 tons, the contract quantity will be considered 1 lot. The lot will be divided into sublots of 500 tons and randomly sampled for asphalt cement content, density, and gradation according to this Subsection. Hot mix asphalt quantities of less than 300 tons remaining after dividing the lot into sublots will be included in the last sublot. Hot mix quantities of 300 tons or greater will be treated as an individual sublot. The lot will be evaluated for price adjustment according to Subsection 408-4.03.

For contract quantity of less than 1,500 tons, or for temporary pavement, asphalt concrete pavement will be accepted for payment based on the Engineer's approval of a Job Mix Design and the placement and compaction of the asphalt concrete pavement to the specified depth and finished surface requirements and tolerances.

Any area of finished surfacing that is visibly segregated or fails to meet surface tolerance requirements is considered unacceptable per Subsection 105-1.11.

1. Asphalt Cement Content. Samples for the determination of asphalt cement content will be taken from either the windrow, the end of the auger, or behind the screed prior to initial compaction. Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if applicable. At the discretion of the Engineer, asphalt cement content will be determined in accordance with ATM 405 or WAQTC FOP for AASHTO T 308.

2. Asphalt Cement Quality. The Contractor shall sample asphalt cement from the asphalt cement supply line when requested, witnessed by the Engineer's representative. After purging residual asphalt cement, take 3 one-quart samples into wide mouth metal containers. Asphalt cement will be sampled for acceptance testing in accordance with WAQTC FOP for AASHTO T 40 and tested for conformance to the specifications in Section 702. Three separate samples will be taken, one for acceptance testing, one for Contractor retesting, and one held in reserve for referee testing.

3. Aggregate Gradation.
   a. Drum Mix Plants. Samples taken for the determination of aggregate gradation from drum mix plants will be from the combined aggregate cold feed conveyor via a diverter device, from the stopped conveyor belt or from the same location as samples for the determination of asphalt cement content. Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if applicable. The aggregate gradation for samples from the conveyor system will be determined in accordance with WAQTC FOP for AASHTO T 27/T 11. For asphalt concrete mixture samples, the gradation will be determined in accordance with WAQTC FOP for AASHTO T 30 from the aggregate remaining after the ignition oven (WAQTC FOP for AASHTO T 308) has burned off the asphalt cement. 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 asphalt concrete mixture.

b. Batch Plants. Samples taken for the determination of aggregate gradation from batch plants will be from the same location as samples for the determination of asphalt cement content, or from dry batched aggregates. Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if applicable. Dry batched aggregate gradations will be determined in accordance with WAQTC FOP for AASHTO T 27/T 11. For asphalt concrete mixture samples, the aggregate gradation will be determined in accordance with WAQTC FOP for AASHTO T 30 from the aggregate remaining after the ignition oven (WAQTC FOP for AASHTO T 308) has burned off the asphalt cement.

4. Density. Cut full depth core samples from the finished asphalt concrete pavement within 24 hours after final rolling. Neatly cut one 6 inch diameter core sample with a core drill from each sublot at the randomly selected location marked by the Engineer. Use a core extractor to prevent damage to the core. The Engineer will determine the density of the core samples in accordance with WAQTC FOP for AASHTO T 166/T 275. Do not core asphalt concrete pavement on bridge decks. Backfill and compact all voids left by coring with new asphalt concrete mixture within 24 hours.

   Failure to cut core samples within the specified period will result in a deduction of $100.00 per sample per day. Failure to backfill voids left by sampling within the specified period will result in a deduction of $100.00 per hole per day. The accrued amount will be subtracted under Item 408(3), Asphalt Price Adjustment.

5. Retesting. A retest of any sample outside the limits specified may be requested provided the quality control requirements of 408-2.05 are met. Deliver this request in writing to the Engineer within 7 days of receipt of the initial test result. The Engineer will mark the sample location for the density retest. The original test results for gradation, asphalt cement content, or density will be discarded and the retest result will be 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. Except for the first lot, gradation or asphalt cement content retesting of the sample from the first sublot of a lot will include retesting for the MSG.

408-4.03 EVALUATION OF MATERIALS FOR ACCEPTANCE. The following method of price adjustment will be applied to each type of Asphalt Concrete Pavement, for which the contract quantity equals or exceeds 1,500 ton, except as defined in Subsection 408-4.02.

Acceptance test results for a lot will be analyzed collectively and statistically by the Quality Level Analysis method as specified in Subsection 106-1.03 to determine the total estimated percent of the lot that is within specification limits. Asphalt cement content results will be reported to the nearest 0.1 percent.

The price adjustment is based on the lowest of two pay factors. The first factor is a composite pay factor for asphalt concrete mixture that includes gradation and asphalt cement content. The second factor is for density.

A lot containing asphalt concrete pavement with less than a 1.00 pay factor will be accepted at an adjusted price, provided the pay factor is at least 0.75 and there are no isolated defects identified by the Engineer. A lot containing asphalt concrete pavement that fails to obtain at least a 0.75 pay factor will be considered unacceptable and rejected under Subsection 105-1.11.

The Engineer will reject asphalt concrete mixture that appears to be defective based on visual inspection. A minimum of two samples will be collected from the rejected mixture and tested if requested. If all test results are within specification limits, payment will be made for the mixture. If any of the test results fail to meet specifications, no payment will be made and the cost of the testing will be subtracted under Item 408(3), Asphalt Price Adjustment. All costs associated with removal and disposal of the rejected asphalt concrete mixture are subsidiary to the Asphalt Concrete pay item.

Outlier Test. Before computing the price adjustment, the validity of the test results will be determined by SP-7, the Standard Practice for Determination of Outlier Test Results. Outlier test results will not be included in the price adjustment calculations.

If any sieve size on a gradation test or the asphalt cement content is an outlier, then the gradation test results and the asphalt cement content results for that sublot will not be included in the price adjustment. The density test result for that sublot will be included in the price adjustment provided it is not an outlier.

If the density test result is an outlier, the density test result will not be included in the price adjustment, however, the gradation and asphalt cement content results for that sublot will be included provided neither is an outlier.

Quality Level Analysis. Pay factors are computed as follows:

1. Outliers (determined by SP-7), and any test results on material not incorporated into the work, are eliminated from the quality level analysis.

   The arithmetic mean ($\bar{x}$) of the remaining test results is determined: $\bar{x} = \frac{\Sigma x}{n}$

   Where: Σ = summation of
   x = individual test value to x_n
   n = total number of test values

   $\bar{x}$ is rounded to the nearest tenth for density and all sieve sizes except the No. 200 sieve.
   $\bar{x}$ is rounded to the nearest hundredth for asphalt cement content and the No. 200 sieve.

2. The sample standard deviation(s), after the outliers have been excluded, is computed:

$$s = \sqrt{\frac{n\Sigma(x^2) - (\Sigma x)^2}{n(n-1)}}$$

Where: $\Sigma (x^2)$ = sum of the squares of individual test values.
$(\Sigma x)^2$ = square of the sum of the individual test values.

The sample standard deviation (s) is rounded to the nearest hundredth for density and all sieve sizes except the No. 200 sieve. The sample standard deviation (s) is rounded to the nearest 0.001 for asphalt cement content and the No. 200 sieve.

If the computed sample standard deviation (s) is <0.001, then use s = 0.20 for density and all sieves except the No. 200. Use s = 0.020 for asphalt cement content and the No. 200 sieve.

3. The USL and LSL are computed. For aggregate gradation and asphalt cement content, the Specification Limits (USL and LSL) are equal to the Target Value (TV) plus and minus the allowable tolerances in Table 408-2. The TV is the specification value specified in the approved Job Mix Design.

TABLE 408-2
LOWER SPECIFICATION LIMIT (LSL) & UPPER SPECIFICATION LIMIT (USL)

Measured Characteristics	LSL	USL
1 inch sieve	TV-1.0	TV
3/4 inch sieve	TV-6.0	TV+6.0
1/2 inch sieve	TV-6.0	TV+6.0
3/8 inch sieve	TV-6.0	TV+6.0
No. 4 sieve	TV-6.0	TV+6.0
No. 8 sieve	TV-6.0	TV+6.0
No. 16 sieve	TV-5.0	TV+5.0
No. 30 sieve	TV-4.0	TV+4.0
No. 50 sieve	TV-4.0	TV+4.0
No. 100 sieve	TV-3.0	TV+3.0
No. 200 sieve[1]	TV-2.0	TV+2.0
Asphalt %	TV-0.4	TV+0.4
Density %	92	98

Note 1.Tolerances for the No. 200 sieve may not exceed the broad band limits in Table 703-3.

4. The Upper Quality Index (Q_U) is computed: $$Q_U = \frac{USL - \bar{x}}{s}$$

Where: USL = Upper Specification Limit
Q_U is rounded to the nearest hundredth.

5. The Lower Quality Index (Q_L) is computed: $$Q_L = \frac{\bar{x} - LSL}{s}$$

Where: LSL = Lower Specification Limit
Q_L is rounded to the nearest hundredth.

6. P_U (percent within the upper specification limit which corresponds to a given Q_U) is determined. See Subsection 106-1.03.

7. P_L (percent within the lower specification limit which corresponds to a given Q_L) is determined. See Subsection 106-1.03.

8. The Quality Level (the total percent within specification limits) is determined for aggregate gradation, asphalt cement content, and density.

$$\text{Quality Level} = (P_L + P_U) - 100$$

9. Using the Quality Levels from Step 8, the lot Pay Factor is determined for Density (DPF) and gradation and asphalt cement content pay factors (PF) from Table 106-2. The maximum pay factor for the largest sieve size specification for gradation is 1.00.

10. The Composite Pay Factor (CPF) for the lot is determined using the following formula:

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

The CPF is rounded to the nearest hundredth.

Table 408-3 gives the weight factor (f) for each sieve size and asphalt cement content.

TABLE 408-3
WEIGHT FACTORS

Gradation	Factor "f"
3/4 inch sieve	4
1/2 inch sieve	5
3/8 inch sieve	5
No. 4 sieve	4
No. 8 sieve	4
No. 16 sieve	4
No. 30 sieve	5
No. 50 sieve	5
No. 100 sieve	4
No. 200 sieve	20
Asphalt %	40

The price adjustment will be based on either the CPF or DPF, whichever is the lowest value. The price adjustment for each individual lot will be calculated as follows:

Price Adjustment = [(CPF or DPF)* -1.00] x (tons in lot) x (PAB)

* CPF or DPF, whichever is lower.

PAB = Price Adjustment Base per ton = $65.00 per ton

EVALUATION OF ASPHALT CEMENT

Asphalt cement will be randomly sampled and tested every 200 tons and evaluated for price adjustment. If the last sample increment is less than 100 tons, that quantity of asphalt cement will be added to the quantity represented by the previous sample and the total quantity will be evaluated for price adjustment. If the last sample increment is greater than 100 tons, it will be sampled, tested and evaluated separately. Asphalt cement pay reduction factors for each sample will be determined from Table 408-4.

The total asphalt cement price adjustment is the sum of the individual sample price adjustments and will be subtracted under Item 408(3), Asphalt Price Adjustment.

Table 408-4
ASPHALT CEMENT PAY REDUCTION FACTORS
(Use the single, highest pay reduction factor)

	(ii) Spec	Pay Reduction Factor (PRF)								
		0	0.04	0.05	0.06	0.07	0.08	0.1	0.25	Reject or Engr Eval
4) Tests On Original Binder										
Viscosity	<3 Pa-s	≤3		>3						
Dynamic Shear	>1.00 kPa	>1.00		0.99-0.88				0.87-0.71	0.70-0.50	<0.50
Toughness	>110 in-lbs	>93.5	90.0-93.4	85.0-89.9	80.0-84.9	75.0-79.9	70.0-74.9			<70.0
Tenacity	>75 in-lbs	>63.8	61.0-63.7	58.0-60.9	55.0-57.9	52.0-54.9	48.0-51.9			<48.0
5) Tests On RTFO										
Mass Loss	<1.00 %	<1.00		1.001-1.092				1.093-1.184	1.185-1.276	>1.076
Dynamic Shear	>2.20 kPa	>2.20		2.199-1.816				1.815-1.432	1.431-1.048	<1.048
6) Test On PAV										
Dynamic Shear	<5000 kPa	<5000		5001-5289				5290-5578	5579-5867	>5867
Creep Stiffness, S	<300 MPa	<300		301-338				339-388	389-450	>450
Creep Stiffness, m-value	>0.300	>0.300		0.299-0.287				0.286-0.274	0.273-0.261	<0.261
Direct Tension	>1.0 %	>1.0		0.99-0.86				0.85-0.71	0.70-0.56	<0.56

Asphalt Cement Price Adjustment for each sample = 5 x PAB x Qty X PRF
PAB = Price Adjustment Base
Qty = Quantity of asphalt cement represented by asphalt cement sample
PRF = Pay Reduction Factor from Table 408-4

Asphalt Cement Appeal Procedure. Once notified of a failing test result of an asphalt cement sample, the Contractor has 21 days to issue a written appeal. The appeal must be accompanied by all of the Contactor's quality control test results and a test result of Contactor's sample of this lot tested by an AASHTO accredited asphalt laboratory (accredited in the test procedure in question). The Engineer will review these test results and using ASTM D3244 determine a test value upon which to base a price reduction.

If the Contractor challenges this value, then the referee sample held by the Department will be sent to a mutually agreed upon independent AASHTO accredited laboratory for testing. This test result will be incorporated into the ASTM D3244 procedure to determine a test value upon which to base a price reduction. If this final value incurs a price adjustment, the Contractor under Item 408(3), Asphalt Price Adjustment, shall pay the cost of testing the referee sample.

The total Asphalt Price Adjustment is the sum of all the price adjustments for each lot.

EVALUATION OF PAVEMENT FOR SMOOTHNESS.

The top layer of asphalt concrete pavement will be measured in accordance with 401-3.15 and evaluated for a smoothness price adjustment. The Engineer will calculate the smoothness price adjustment as follows:

Smoothness Price Adjustment = PAB x PQ x SF

PAB = Price Adjustment Base (408-4.03)
PQ = Final quantity of Asphalt Concrete Mixture
PrI = Profile Index
SF = Smoothness Factor

PQ = Final quantity of Asphalt Concrete Mixture, tons
PrI = Profile Index as inches per mile

If the PQ is less than 1,500 tons,	SF = 0
If the PQ is 1,500 to 5,000 tons,	SF = 0.1166 – (0.01666 x PrI)
If the PQ is greater than 5,000 tons,	SF = 0.0583 – (0.0083 x PrI)

The smoothness price adjustment will be applied under Item 408(3), Asphalt Price Adjustment.

EVALUATION OF LONGITUDINAL JOINT DENSITY

Longitudinal joint density price adjustments apply when asphalt concrete mixture quantities are equal to or greater than 1,500 tons. A price adjustment will be based on the average of all the joint densities on a project and determined as follows:

1. If project average joint density is less than 91% MSG, apply the following disincentive:

Deduct = ($1.00 per lineal foot) x (lineal feet of paved joint for the entire project) x (91 % – Project Average Joint Density %) x 100 (Note: convert % to decimals in this equation)

2. If project average joint density is greater than 91% MSG apply the following incentive:
Add = ($1.00 per lineal foot) x (lineal feet of paved joint for the entire project) x (Project Average Joint Density % – 91%) x 100 (Note: convert % to decimals in this equation)

The longitudinal joint price adjustment will be included in Item 408(3), Asphalt Price Adjustment.

408-5.01 BASIS OF PAYMENT. The accepted quantity will be paid for at the adjusted contract unit price for the pay item listed below, complete in place.

The Asphalt Price Adjustment will be the sum of the price adjustments for each lot, and for fees accrued for failure to cut cores and/or backfill voids left by sampling in the allotted time as outlined in Subsection 408-4.02.

Asphalt cement, anti-stripping additives, tack coat, and crack sealing are subsidiary to the asphalt concrete pavement unless specified as pay items.

Payment for furnishing and installing joint adhesive and sealing the pavement adjacent to the joints will be paid as 408(4) Longitudinal Joint Adhesive and Sealing.

Price adjustments will not apply to:

1. Asphalt Concrete Mixture for leveling course

2. Temporary Pavement

Payment will be made under:

Pay Item	Pay Unit
408(1A) Asphalt Concrete, Type V	Ton
408(1B) Asphalt Concrete, Type VH, Hard Aggregate	Ton
408(2) Asphalt Cement, Grade PG 64-28	Ton
408(3) Asphalt Price Adjustment	Contingent Sum
408(4) Longitudinal Joint Adhesive and Sealing	Linear Foot

SECTION 501

STRUCTURAL CONCRETE

Special Provision

501-3.01 PROPORTIONING.

Under 1, Contractor Mix Design, delete the first sentence of the second paragraph and substitute the following:

1. Contractor Mix Design. Design normal weight concrete according to ACI 301, Section 4 and ACI 214, using the absolute volume method per ACI 211.1

(11/05/02)R37USC02

501-4.01 METHOD OF MEASUREMENT. *Add the following:*

Reinforcing steel, porous backfill material, mortar and rock used for the construction of sidewalk retaining wall, as shown on the Plans, will not be measured for payment.

501-5.01 BASIS OF PAYMENT. *Delete the first paragraph and substitute the following:* The quantities of reinforcing steel, porous backfill material, mortar and rock, and other items included in cast-in-place structures are subsidiary to Concrete at the Contract price.
(11/18/04)R&M

SECTION 504

STEEL STRUCTURES

Special Provision

CONSTRUCTION REQUIREMENTS

504-3.01 FABRICATION. *In subsection 8, Welding, replace Item e in the second paragraph with the following:*

e. Name and qualifications of NDE technicians.

SECTION 505

PILING

Special Provision

505-3.03 PILE BEARING VALUES.

Delete the first paragraph of this Subsection and substitute the following:

Drive all piles, except piles for lighting standards, to the required ultimate bearing capacity. For lighting standards, install piles of sufficient length to cut the pile at the required cut-off elevation and to provide the minimum installed length shown on the Plans.

505-3.09 DRIVING PILES.

Add the following:

In many cases, you may need to pre-bore, spud, use a larger pile-driving hammer, and excavate inside the pile in addition to normal pile driving techniques. Sites for the lighting standard foundations can contain subsurface soils that consist of very dense sandy gravel with cobbles and boulders.

Submit a pile-driving plan to the Engineer, for approval, at least 14 calendar days before driving the first steel pipe pile. At a minimum, the pile-driving plan shall consist of the following:

a. pile driving hammer, or hammers, to be used,
b. alternate techniques planned for pile installation, and
c. equipment used for the pile driving operation.

When you cannot achieve the minimum installed length shown on the Plans, install the pile tip to an elevation established by the Engineer.
(06/26/03) R65USC02

Add the following Subsection:

505-3.14 WELDING. Welding and inspection shall conform to the requirements of the latest edition of the American Welding Society (AWS) Structural Welding Code, D1.1.

1. Qualifications of Process, Procedures, and Joint Details. For each joint to be used in construction, the joint details, electrode classification or grade, electrode diameter, voltage, amperage, order and relative position of passes, number and thickness of layers and other pertinent information shall be clearly presented in the welding procedure(s) submitted by the Contractor for the approval of the Engineer.

Requirement for procedures qualification is waived if the Contractor's welding procedure is in accordance with the requirements of the welding procedures specification contained within the AWS Structural Welding Code, D1.1.

2. Welders, Certification and Testing. Welders and welding operators shall be certified in conformance with the AWS Structural Welding Code, D1.1. Welders or welding operators lacking current AWS Structural Welding Code D1.1 certification will not be permitted to perform welding on this project.

3. Inspection of Shop Work and Records. Welds, including joint preparation, fit-up and alignment, will be completely (100 percent of the weld) inspected visually and radiographed in conformance with AWS Structural Welding Code, D1.1. Ten percent of the length, as determined by the Engineer, of each weld will be radiographic tested. If a rejectable defect is found, then 100 percent of the length of the weld in that piece will be radiographically tested.

   The Engineer will examine and approve satisfactory welds, disapprove or reject unsatisfactory welds, approve satisfactory methods proposed by the Contractor for repairing disapproved welds, and inspect the preparation and rewelding of disapproved welds. Copies of the welding fabrication documentation, including the weld testing results, will be forwarded to the Engineer.

4. Obligation of Contractor. The Contractor shall comply with the requests of the Engineer to correct improper workmanship and to remove and replace, or correct as instructed, welds found defective or deficient by visual inspection or by nondestructive testing.

5. Visual Inspection. Welds shall be completely visually inspected. A weld shall be acceptable by visual inspection if it shows that:

   a. the weld has no cracks,

   b. thorough fusion exists between adjacent layers of weld metal and between weld metal and base metal,

   c. craters are filled to the full cross section, and,

   d. the completed weld conforms to the provisions of the AWS Structural Welding Code, D1.1.

6. Nondestructive Testing. The method of nondestructive testing will be radiographic testing in conformance with AWS Structural Welding Code, D1.1. Field welds are not subject to nondestructive testing.

7. Destructive Testing. The location, method and extent of mandatory destructive testing to be performed (if any) will be indicated on the contract drawings. Other welds will nor-

mally be inspected by visual methods and nondestructive testing; however, the Engineer may require destructive testing of any weld that in his opinion does not meet the criteria for radiographic acceptance.

The cost associated with destructive testing of questionable welds will be borne by the Department for welds meeting radiographic acceptance criteria and by the Contractor for welds not meeting radiographic acceptance criteria. The cost of destructive testing of welds designated for destructive testing on the contract drawings will be borne by the Contractor.

The Contractor is responsible for removing any weld specimen for destructive testing and repairing the weld afterwards.

8. Preparation of the Weld. The edges of the parts to be joined by welding shall be prepared by accurately cutting, grinding or machining to shape as indicated on the contract drawings and will be visually inspected prior to welding by the Engineer.

9. Backing. Backing rings or strips shall be utilized on all field butt welded joints welded from one side unless otherwise shown on the contract drawings or approved by the Engineer. Open root joints are permissible where the joint is inaccessible from both sides.

10. Cleaning. Each completed bead shall be thoroughly cleaned of all slag, or other foreign matter, before proceeding with the next bead. Hand clipping, power driven wire brushed, needle scalers, or grinders shall be used.

Full compensation for welding, weld inspection, weld testing, including the necessary tools, equipment, scaffolding and other support facilities required to perform welding, welding inspection, including the cost of radiographic testing will be subsidiary to the price bid for the piling items of the contract and no separate payment will be made. (01/31/96)R146

505-4.01 METHOD OF MEASUREMENT.

Add the following to the second paragraph:

Do not measure piles for lighting standards for payment.

505-5.01 BASIS OF PAYMENT.

Add the following to the second paragraph: Include all costs of furnishing and installing piles for lighting standards in Item 660(3), Highway Lighting System Complete.

(06/26/03) R65USC02

SECTION 603

CULVERTS AND STORM DRAINS

Special Provisions

603-1.01 DESCRIPTION. *Add the following:* This work also consists of installing culvert marker posts.

603-2.01 MATERIALS. *Delete the second paragraph and substitute the following:* When Item 603(17-xx), Pipe, is listed in the bid schedule, furnish either Corrugated Steel Pipe (CSP) or Reinforced Concrete Pipe. Corrugated Polyethylene Pipe is not allowed. End Sections for Metal Pipe must be of the same material as the pipe.

Add the following: Culvert marker posts shall meet the requirements of Subsection 730-2.05 Flexible Delineator Posts. The color shall be blue with no other markings. The 2.5-inch by 6-foot post shall be rectangular in cross-section with reinforcing ribs capable of a minimum bending radius of 9 inches.

Add the following Subsection:

603-3.06 CULVERT MARKER POSTS. Culvert marker posts shall be installed 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 by the Engineer. Forty-two (42) inches of post shall remain above the ground after driving.

603-4.01 METHOD OF MEASUREMENT. *Add the following:* Culvert marker posts will not be measured for payment.

Pipe, associated couplings, and hardware used to reconnect the existing storm drain pipe to new manholes will not be measured for payment.

603-5.01 BASIS OF PAYMENT. *Add the following:* Culvert marker posts will not be paid for directly, but will be subsidiary to pipe items.
(08/27/03)R42USC (11/21/04)R&M

SECTION 604

MANHOLES AND INLETS

Special Provision

604-1.01 DESCRIPTION. *Add the following:* This work also includes inspecting and cleaning the existing storm drain system and determining elevations of pipe penetrations for new manholes.

604-3.01 CONSTRUCTION REQUIREMENTS. *Add the following after the third sentence*:

Any proposed access manhole that falls within a concrete sidewalk or asphalt pathway must have a lid with a rough cobbled grit surface, or be specifically designed to hold a minimum of 1 inch of concrete or asphalt, as applicable.

Add the following: At locations where new structures are being installed, cut the existing pipe(s) back as necessary to allow installation of the new structure. New pipe matching the size and type of the existing pipe shall be used to connect the existing pipe to the new or relocated structure. If a joint on the existing pipe is within three feet of the new or relocated structure, and the existing pipe must be cut, then the pipe shall be removed back to the joint and new pipe installed. New bands shall be used to connect new to existing pipe.

Determine pipe penetrations for new structures as follows:

1. Match existing pipe elevations where manholes connect to existing pipe.
2. For manholes connecting new pipe to the existing storm drain, the inlet pipe invert shall be at least 0.1 feet above the outlet invert. Match crowns if inlet pipe diameter is smaller than the outlet pipe diameter.
3. For manholes connecting to new pipe only, set the pipe elevation 0.003 times the length of new pipe shown on Plan above the downstream end of pipe.

Obtain existing storm drain pipe size, type, and invert elevations in accordance with Section 642 Construction Surveying and Monuments for surveying requirements.

Under the heading "Reconstruct existing manhole by using one or more of the following methods," add the following:

8. Remove and dispose of the existing reducing slab and adjustment rings and install a new cover slab.

Delete the seventeenth paragraph that begins with "In roadways," and substitute the following:
In roadways, set the manhole frame and cover to 3/8-inch plus or minus 1/8-inch below the finished pavement surface. In walkways and bike paths, set the manhole frame flush with the surface.

Add the following:

Notify the Engineer a minimum of five (5) days prior to removing the frame and grate. The Engineer will notify the Street Maintenance Control Center (343-8277) and have an MOA representative physically identify frames and grates to be salvaged. Deliver frames and grates designated to be salvaged to the MOA KLOEP Station located at 5701 Northwood Street. All frames and grates not designated for salvage by MOA shall become the Contractor's property.

When installing new pipe in an existing manhole, cleanly cut a hole by approved means at the invert elevation given on the plans and 2 inches larger than the outside diameter of the new pipe. Then, grout joint with non shrinking cement mortar.

All curb inlet structures shall have a 3 inch formed hole approximately 2 feet below the top of casting on the project centerline side to provide for direct drainage during subgrade construction to avoid embankment saturation. Keep the openings functional. This may require temporary dikes, RMC extensions, etc., as necessary. Fill these holes with grout upon final paving.

Cast standard drainage structure steps during structure pour or install them before concrete hardens.

Within 30 days of beginning other construction activities, the Contractor shall inspect and clean storm drain manholes, inlets, catch basins, sumps, mainlines, laterals, and culverts.

Probe the manholes with a calibrated bar. If 50% or more of the manhole sump is filled with the debris, remove the debris. Remove debris from catch basins and inlets regardless of the quantity of debris. No more than 5%-10% of debris should remain. Remove debris (sticks, plastic bags) blocking culvert inlets and outlets. Record the date in inspection, the depth of sediments, and whether the manhole was cleaned or not in a grid map book provided by the Engineer.

The contractor shall provide equipment that is capable of cleaning storm drains. The equipment shall be inspected and accepted by the Engineer before use on this project. The contractor shall provide traffic control while cleaning storm drains.

The work shall include disposal of silt, trash, debris and other material removed from the system. This material may be disposed at the Municipality of Anchorage Hazardous Materials Waste Disposal site.

604-4.01 METHOD OF MEASUREMENT.

Add the following:

Frames, grates and lids will not be measured for payment.

Item 604(20) Clean Drainage System, will be measured in the manner specified in the directive authorizing the work.

604 5.01 BASIS OF PAYMENT. *Add the following:*

Frames, grates and lids are subsidiary to the drainage structure.

Item 604(20) Clean Drainage System, will be paid at the lump sum price shown on the bid schedule. Traffic Control provided to clean storm drains will be paid under the 643 items.

Payment for removal of existing pipe and installation of new pipe and fittings necessary to re-connect the existing storm drain system to new manholes will not be paid for separately but will be subsidiary to Item 604(1A), Storm Drain Manhole, Type 1.

Delete Item 604(1) Storm Sewer Manhole and add the following new pay items:

Pay Item	Pay Unit
604(1A) Storm Drain Manhole, Type 1	Each
604(3C) Replace Manhole Cover or Inlet Casting, Frame and Grade Ring	Each
604(18) Adjust Existing Sanitary Sewer Cleanout	Each
604(20) Clean Drainage System	Lump Sum

(09/11/03) R43USC02 (11/18/04)R&M

SECTION 607

FENCES

Special Provision

607-1.01 DESCRIPTION. *Add the following:* This work shall also consist of furnishing and erecting pipe and chain fence, including galvanized steel pipe, surface mounting brackets, chain, and other required materials and installing the fence on the concrete retaining wall as shown in plans.

607-2.01 MATERIALS. *Add the following:* Galvanized steel pipe members shall conform to ASTM A53, Type E or S, Grade B. Primer and Paint shall conform to Section 708, Paints.

607-3.01 CONSTRUCTION REQUIREMENTS. *Add the following:* The chain shall be welded at galvanized steel pipe members as shown on plans. Posts shall be set plumb. The chain shall be welded between the posts in a manner resulting in a smooth, continuous installation with chain that sags evenly between the posts.

All damaged galvanizing shall be wire brushed with an electric grinder with wire wheel to remove slag and residual burn material. After cleaning, then hot stick zinc coat damaged galvanizing. All galvanized metal shall then be painted.

607-4.01 METHOD OF MEASUREMENT.

Add the following:

Pipe and chain fence will be measured by the linear foot from end to end of the posts complete in-place.

607-5.01 BASIS OF PAYMENT.

Add the following new pay item:

Pay Item	Pay Unit
607(12) Pipe and Chain Fence	Linear Foot

(1/19/04) R&M

SECTION 608

SIDEWALKS

Special Provision

608-2.01 MATERIALS. *Delete paragraph number 2 and substitute the following:*

2. Asphalt Sidewalk

Asphalt Cement, PG52-28	Subsection 702-2.01
Aggregate, Type II or III	Subsection 703-2.04

Mix Design Requirements (ATM T-17)

Marshall Stability, pounds, min.	1,000
Percent Voids, Total Mix	2-5
Compaction, Blows/side	50

(2/1/00)R47USC (11/19/04) R&M

Standard Modification

608-3.03 CURB RAMPS. *Delete this Subsection in its entirety and replace with the following:*

Construct curb ramps according to the details and the locations shown on the Plans. Follow the construction requirements of Subsection 608-3.01. Give the exposed concrete surface a coarse broom finish. Install detectable warnings.

Add new Subsection:

608-3.04 DECTECTABLE WARNINGS. Construct detectable warnings according to the details and the locations shown on the Plans. Install cast in place tactile tiles integral with new construction. Install either molded in place epoxy systems, or remove the ramp and replace ti with new concrete and integrally attached tactile tile, when retro-fitting existing cured concrete ramps. Install tile so there are no vertical changes in grade exceeding 0.25 inches or horizontal gaps exceeding 0.5 inches. Align pattern on a square grid in the predominate direction of travel. Detectable warnings are made of composite materials, safety yellow color, slip resistant, with truncated dome pattern.

Detectable warnings shall be manufactured and installed according to the Americans with Disabilities Act Accessible Guideline.

608-4.01 METHOD OF MEASUREMENT. *Delete "Curb Ramp" paragraph of subsection and replace with the following:*

Curb Ramp. By each installation, complete in place, including detectable warnings, ramp runs, flares and landings necessary to provide a single street level access.
E20(6/30/04) (11/19/04) R&M

Special Provision

608-5.01 BASIS OF PAYMENT. *Add the following:* Backing curb will be subsidiary to Item 608(6), Curb Ramp.

The composite detectable warning tiles are subsidiary to item 608(6) Curb Ramp.

(06/11/02)R256USC

SECTION 609

CURBING

Special Provision

609-2.01 MATERIALS.

Add the following: Epoxy cement used to cement expressway dowelled curb to pavement shall conform to ASTM C-881, Type II, such as sikador 32, Hi-Mod or equal.

609-3.01 GENERAL. *Add the following:* Where Control (line and grade) for new curb is based on the existing curb, the Contractor shall adjust the curb forms or string line to remove apparent irregularities before placing the concrete. Forms or stringline shall be approved by the Engineer prior to placing concrete. Reference Section 642, Construction Surveying for surveying requirements.
(11/19/04)R&M

609-3.02 CAST-IN-PLACE CONCRETE CURBING.

Add the following to the sixth paragraph:

Concrete placed by the extrusion or slip-form process shall have a slump of less than 2 inches.

(11/06/02)R202USC02

SECTION 615

STANDARD SIGNS

Special Provision

615-2.01 MATERIALS.

Under item 1. delete the first sentence and substitute the following:

Unless Shop Drawings have been provided in the Contract, submit shop drawings for signs that require the use of the Alaska Sign Design Specifications (ASDS), the Department of Transportation and Public Facilities - Sign Face Fabrication Requirements, and the Alaska Traffic Manual, letter width and spacing charts for approval before fabrication.
(11/06/02) R50USC02

Standard Modifications

Under Item 2. Sign Fabrication, delete Items b. and c. and replace with the following:

b. Railroad Crossbucks and Vertical Crossbuck Support Panels: Use 3M Diamond Grade VIP", or approved equal.

c. Non-Illuminated Overhead Signs with White Legends on Green Backgrounds: Use 3M "Diamond Grade LDP" (Long Distance Performance) sheeting for legends on 3M "High Intensity" beaded background sheeting, or approved equal on sheet aluminum panels.

E13(6/30/04)

Special Provision

615-3.01 CONSTRUCTION REQUIREMENTS. *Delete the sixth sentence of the first paragraph of item 7 and substitute the following:*

Deliver sign panels, posts and hardware to the MOA Plaint and Sign Shop at 2839 Mountain View Drive.

615-3.02 SIGN PLACEMENT AND INSTALLATION. *Add the following:*

Do not remove existing signs without authorization from the Engineer.

615-5.01 BASIS OF PAYMENT. *Delete the first sentence and substitute the following:* Sign posts, bases, mounting hardware and concrete used for sign bases are subsidiary.

Add the following:

No separate payment for keeping existing signs in service until they are no longer needed, or temporary relocation of existing signs will be made. This work is subsidiary to Item 615(1), Standard Sign.

No separate payment for removal of existing sign post foundations, or work required to abandon them in place will be made, but shall be subsidiary to Item 615(1), Standard Sign.

No separate payment for salvaging activities detailed in Subsection 615-3.01 will be made. This work will be subsidiary to Item 615(1), Standard Sign.

(11/06/02)R50USC02

SECTION 618

SEEDING

Special Provision

618-1.01 DESCRIPTION. *Add the following:*

Topsoil and seed new or disturbed slopes and other areas directed by the Engineer. Track the soil and apply seed, mulch, fertilizer and water. Provide a living ground cover on slopes as soon as possible.

618-2.01 MATERIALS. *Add the following to the list of material specifications:*

Mulch Subsection 727-2.01

618-3.01 SOIL PREPARATION.

Add the following:

Apply seed as detailed in Subsection 618-3.03 immediately after the shaping of the slopes. Cover all slopes to be seeded with topsoil according to Section 620. Prepare slopes for seed by "walking" a dozer transversely up and down the slopes, or by grading with a scarifying slope board, as determined by the Engineer. The resultant indentations shall be perpendicular to the fall of the slope. Complete slope preparation as soon as topsoil is placed on the slopes. Rounding the top and bottom of the slopes is acceptable to facilitate tracking and to create a pleasing appearance, but do not disrupt drainage flow lines.

618-3.02 SEEDING SEASONS.

Add the following:

Seeding shall be performed between May 15 and September 1.

618-3.03 APPLICATION.

Add the following:

Apply seed, mulch and fertilizer as follows per pound. Apply seed and mulch in one application using the hydraulic method. Apply fertilizer in a separate application approximately 30 days after seeding or as growing season allows, using the hydraulic method.

Seed Mix	Component	Ingredients	Application Rate (per MSF)
Type A	Seed	Alpine Bluegrass (Gruening)	0.50 lbs.
		Red Fescue (Arctared)	0.40 lbs.
		Annual Ryegrass (Lolium)	0.10 lbs.
			Total = 1.00 lbs
	Soil Stabilizer		
	Slope ≤ 3:1	Mulch	46 lbs.
	Slope >3:1	Mulch with tackifier	45-58 lbs.
	Fertilizer	20-20-10	12.0 lbs.

Do not remove the required tags from the seed bags.

618-4.01 METHOD OF MEASUREMENT. *Delete this subsection in its entirety and replace with the following:* Section 109.

618-5.01 BASIS OF PAYMENT. *Delete this subsection in its entirety and replace with the following:*

The work described under Subsection 618-3.01, Soil Preparation, is subsidiary to seeding.

Water required for the hydraulic method of application of seed, mulch, and fertilizer is subsidiary to Item 618(2A) Seeding, Type A.

All required Water for Seed Maintenance is subsidiary to Item 618(2A) Seeding, Type.

Payment will be made under:

Pay Item	Pay Unit
618(2A) Seeding, Type A	Lump Sum

(11/06/02)R52USC (11/06/02)R&M

SECTION 620

TOPSOIL

Special Provision

620-2.01 MATERIALS.

Add the following:

Topsoil shall be Class A.

620-4.01 METHOD OF MEASUREMENT.

Add the following:

Limestone, if required, will not be measured for payment, but will be subsidiary to Item 620(1A) Topsoil, Class A.

(11/06/02) R53USC02

620-5.01 BASIS OF PAYMENT.

Delete Item 620(1), Topsoil, and add the following new pay item:

Pay Item	Pay Unit
620(1A) Topsoil, Class A	Square Yard

SECTION 627

WATER SYSTEM

627-1.01 DESCRIPTION. *Add the following*: For purposes of these Special Provisions, Water Utility shall mean Anchorage Water & Wastewater Utility at (907) 564-2765. This work shall include the installation, testing, flushing, and chlorination or hand cleaning of water systems for acceptance by the Water Utility. The Contractor shall also provide as-builts in accordance with the conditions prescribed herein.

In conjunction with working around and/or adjusting the Water Utility water valves, the Contractor shall exercise due care. Prior to commencement of work by the Contractor, the Water Utility shall check deficiencies which may exist in any valve or valve box. The Engineer and Contractor shall witness the condition and location of each valve or valve box. Failure to participate in the inspection by the Contractor will result in his forfeiting all rights to deny damages at a later date during the course of the work. Notice that the Contractor is ready for the above inspection shall be in writing to the Water Utility and shall be submitted giving at least 48 hours notice. The Contractor shall furnish a copy of the notice to the Engineer.

It shall be the Contractors responsibility to protect and maintain all valves and valve boxes in an operable condition during all phases of construction. If at any time after the inspection as outlined above the Water Utility finds a valve or valve box damaged or rendered inoperable by the Contractor, the Contractor shall repair them at his own expense.

627-2.01 MATERIALS. *Add the following:*

Tie back rods and/or tie back rod and shackle assemblies will not be acceptable as restrained joints or restraining system for fittings, valves, piping deflection points.

Unless otherwise detailed on the plans, pipe joints shall be push-on rubber gasket type conforming to AWWA C111. Where specified on the plans, restrained joint pipe shall be EBAA Iron MEGALUG, Romac Industries GripRing, U.S. Pipe Field LOK Gasket System, or approved equal. All restrained joint installation areas shall include joints, fittings, and piping deflection points.

Contractor shall provide pipe manufacturer submittals which include thrust restraint calculations prior to construction.

CONSTRUCTION REQUIREMENTS

627-3.01 GENERAL. *Add the following before the first paragraph*: The Water Utility, through the Engineer, reserves the right to suspend the water system installation at any time that the Contractor fails to meet the requirements set forth herein until such time as the Contractor makes the necessary corrections. Suspensions of work will not entitle the Contractor to an extension of time for the completion of the project, and will not entitle him to extra payment for costs incurred.

The Contractor shall furnish to the Engineer complete installation drawings for the project prior to fabrication. All restrained joint areas shall be detailed to include fittings, piping and deflection points. The Contractor shall provide design calculations, prepared and sealed by a licensed professional engineer, registered in the State of Alaska, for all restrained joint areas to assure adequacy, ability to resist longitudinal forces and compliance with the Contract Documents.

Contractor shall field demonstrate to the Engineer the installation and/or construction of each new restrained joint or restraining system. Contractor shall provide AWWU with a minimum of 48 hours notice, excluding non-working days, to coordinate the review of the field demonstration. The Contractor shall certify that the restrained joint system is installed in accordance with the manufacturer's instructions. If Contractor fails to install the restrained joint system in accordance with manufacturer's instructions, in the opinion of the Engineer, Contractor shall remove the disapproved system and replace with a new restrained joint system.

Contractor shall be responsible for access to the field demonstration location and all trench excavation, dewatering, and backfill operations prior to, during, and after the restrained joint system is reviewed by the Engineer. The cost for coordinating and providing access for review of Contractor's installation and/or construction of the restrained joint system shall be incidental to the bid item under construction.

If construction or excavation require the removal of any existing privately owned facilities on the provided water easements, the Contractor shall be responsible for coordinating with the owner and for reestablishing lawns, driveways, parking lots, etc., at unit bid prices, where applicable. Any restorative work will be completed as soon as practicable after the installation, but in no case shall the period of time exceed 2 weeks.

Add the following to the third sentence of the third paragraph: "or so proper alignment and/or grade may be determined before the pipe sections are laid in the trench and backfilled."

Delete the fifth, sixth and seventh paragraphs and substitute the following: Prior to removing or disrupting service to fire hydrants, the Contractor shall contact the Anchorage Fire Department, Chief Dispatcher at 267-4950 and Deputy Fire Chief at 267-4935 at least 48 hours in advance of any construction.

The Contractor shall provide written notice to all affected property owners, the Engineer, the Anchorage Fire Department and the Water Utility 72 hours prior to interruption of the Water Utility's water service. The Contractor shall schedule AWWU inspection of water pipe, fittings and appurtenances 72 hours prior to water shut down. Contact Brian Baus at AWWU (phone 564-2765) to schedule water shutdown and inspection of water pipe, parts and materials. The Contractor shall provide temporary service to all those property owners with disrupted water service if the interruption exceeds 6 hours.

Construction requiring water service interruption shall be scheduled so that the 6 hour water shut down is between 11:00 PM Friday to 5:00 AM Saturday or 11:00 PM Saturday to 5:00 AM Sunday.

The Contractor shall provide any necessary fittings, valves, temporary connections or appurtenances necessary in order to maintain the water distribution system. Any costs involved in service changeovers and providing temporary water service shall be subsidiary. The Contractor shall be responsible for all damages incidental to interruption of service that may be due to his operations.

There is an existing "circulation type" fire hydrant near Station 85+40 that is to be removed and replaced. The "circulation type" fire hydrant has two legs that connect to a 10" AC water main. Remove the existing fire hydrant and the portion of AC water main between the two connection points, the main line connection fittings, and what ever main line is necessary to avoid leaving sections of AC water main less than 5 feet in length. Replace the AC water main with 10" ductile iron pipe and install the new fire hydrant assembly using a "T" fitting at the main.

Prior to water system installation, the Contractor shall submit to the Engineer a detailed plan for the installation of the new water systems and for removal/abandonment of existing water systems that are to be removed or abandoned for review prior to commencement of work. The plan shall be of sufficient detail to clearly indicate the proposed work sequence, schedules, and disruption of water service.

Replace the eighth paragraph with the following: Restrained joints shall be used where the pipe line terminates or changes alignment, utilized a tee, cross, bend, reducer, or similar fitting.

Add the following:

AC Pipe. The Contractor shall remove and dispose of the AC pipe from the trench. The Contractor is hereby notified that Federal regulations governing the removal and disposal of asbestos containing material are NESHAP 40 CFR, Part 61, Subpart M, and OSHA 29 CFR 1910. Alaska Department of Environmental Conservation requirements include, but are not limited to 18 AAC 50, Air Quality Control Regulations, and 18 AAC 60, Solid Waste Management Regulations. Alaska Department of Labor's governing regulations include, but are not limited to Occupational Safety and Health Standard, Subchapter 04.0103: Asbestos; 8 AAC 61.600.790 Article 8; and Alaska Workers Right to Know, AS 18.60. AC pipe removed from the trench must be handled and disposed in accordance with the applicable Federal and State regulations. AC pipe must be disposed of and declared at the Municipality of Anchorage, Highland Road Municipal Landfill. Proof of disposal shall be submitted to the Engineer.

Disconnect Water Service. In the course of construction, the Contractor will encounter water service pipe requiring disconnection from mains. The Contractor shall disconnect the existing water services by excavating to the main at the locations noted on the plans, closing the corporation stop and installing a plug in the valve body after the house service is disconnected. This item of

work shall include all materials, excavation, disconnection, backfill with native materials, and mechanical compaction for completed services in-place.

Rights In and Use of Materials Found on the Work Site. Unless specifically addressed otherwise in these special provisions, all existing water valves, tees, bends, and conduit (including ductile iron pipe) removed but not reinstalled, and declared "salvageable materials" shall become the property of the Contractor. Fire hydrants will be returned to the AWWU Warehouse. Contractor shall coordinate delivery of fire hydrants three working days in advance with Brian Baus, 564-2765.

Final Acceptance. The Contractor shall, upon completion of all work involved, notify the Engineer in writing of completion and request a pre-final inspection of the project. This inspection will be performed in the presence of the Engineer, the Water Utility, and the Contractor. Copies of a list of deficiencies, if any, indicated by this inspection will be furnished to the Contractor for remedial action. When all corrective action has been completed, the Contractor shall notify the Engineer, and an acceptance inspection will be performed.

627-3.02 INSTALLATION OF CONDUIT. *Add the following to the second paragraph*: However, at a sufficient distance prior to encountering a known obstacle or tying into an existing pipe, the Contractor shall expose and verify the exact location of the obstacle or pipe so proper alignment and/or grade may be determined before the pipe sections are laid in the trench and backfilled. The costs incurred for removal and realignment of backfilled conduit sections due to improper verification methods shall be borne by the Contractor.

Delete the eighth paragraph and substitute the following: Maximum deflection of pipe per joint shall not exceed 80% of the manufacturer's recommended deflection (4 degrees).

The Contractor shall have survey instruments such as transit and level for transferring alignment and grades from offset hubs. He/she shall also have in his employ a person who is qualified to use such instruments and who shall have the responsibility of placing and maintaining such construction guides. The Contractor shall furnish to the Engineer a copy of the surveyor's record notes for the newly-installed conduit and appurtenances. The practice of placing backfill over a section of conduit to provide a platform for the instruments shall be subject to the approval of the Engineer.

Add the following:

Conduit Joints. Conduit that has the grade or joint disturbed after laying shall be taken up and relaid. Water shall be kept out of the trench until the jointing is completed.

All fire lines shall have restrained fittings.

The Contractor has the option of using either mechanical or push-on joints for conduit installed in trenches. All joints shall conform to the requirements of AWWA C-600. Contractor shall field install restrained fittings on all mechanical joints.

Two electrical continuity straps shall be installed on each side joint for pipes less than 12-inches in diameter. Straps are to be welded to a clean, dry surface. All welds and uncoated surfaces shall be coated with a coal tar pitch to the satisfaction of the Engineer.

Conduit Wrap. The outside of all ductile iron and cast iron pipe, fittings, valves and other appurtenances used in water line and fire hydrant construction shall be encased with 1 layer of 8-mil thick polyethylene film. The polyethylene encasement shall be installed using any the following three methods:

Method A

1. Cut polyethylene tube to a length approximately 2-feet longer than the length of the pipe section. Slip the tube around the pipe, centering it to provide a 1-foot overlap on each adjacent pipe section and bunch it accordion-fashion lengthwise until it clears the pipe.

2. Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at the joints to facilitate installation of the polyethylene tube.

3. After assembling the pipe joint and testing the bonded joint, make the overlap of the polyethylene tube. Pull the bunched polyethylene from the preceding length of pipe, slip it over the end of the new length of pipe, and secure in place. Then slip the end of the polyethylene from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Secure the overlap in place. Take up the slack width to make a snug, but not tight fit along the barrel of the pipe, securing the fold at quarter points.

4. Repair any rips, punctures, or other damage to the polyethylene with adhesive tape or with a short length of polyethylene tube cut open, wrapped around the pipe, and secured in place. Proceed with installation of the next section of pipe in the same manner.

Method B

1. Cut polyethylene tube to length approximately 1-foot shorter than that of the pipe section. Slip the tube around the pipe, centering it to provide 6-inches of bare pipe at each end. Take up the slack width at the top of the pipe to make a snug, but not tight, fit along the barrel of the pipe, securing the fold at quarter points; secure the ends as described in Method A.

2. Before making up a joint, slip a 3-foot length of polyethylene tube over the end of the preceding pipe section, bunching it accordion-fashion lengthwise. After completing the joint, pull the 3-foot length of polyethylene over the joint, overlapping the polyethylene previously installed on each adjacent section of pipe by at least 1-foot; make each end snug and secure as described in Method A.

3. Repair any rips, punctures, or other damage to the polyethylene with adhesive tape or with a short length of polyethylene tube cut open, wrapped around the pipe, and secured in place. Proceed with installation of the next section of pipe in the same manner.

Method C

1. Cut polyethylene sheet to a length approximately 2-feet longer than that of the pipe section. Center the cut length to provide a 1-foot overlap on each adjacent pipe section, bunching it until it clears the pipe ends. Wrap the polyethylene around the pipe so that it circumferentially overlaps the top quadrant of the pipe. Secure the cut edge of polyethylene sheet at intervals of approximately 3-feet.

2. Lower the wrapped pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at joints to facilitate installation of the polyethylene. After completing the joint, make the overlap and secure the ends as described in Method A.

3. Repair any rips, punctures, or other damage to the polyethylene with adhesive tape or with a short length of polyethylene tube cut open, wrapped around the pipe, and secured in place. Proceed with installation of the next section of pipe in the same manner.

Thrust Restraint. Conduit ends left for future connections shall be plugged or capped and anchored as shown on the plans, or as directed by the Engineer.

627-3.03 FIRE HYDRANTS. *Delete this subsection in its entirety and substitute the following:*

Fire Hydrant Installation: The Contractor shall furnish and install "L-Base" Fire Hydrant Assemblies, including the fire hydrant leg pipe, auxiliary gate valve, valve box, steam thaw piping, restrained joints, and fire hydrant at the locations shown on the plans. The Contractor shall install the gate valve with box and the proper length of leg section to provide the desired offset of the fire hydrant from the centerline. The barrel installation required will be a 10-foot section associated with the new hydrant. The Water Utility will be responsible for vertical adjustments of all fire hydrants. Fire hydrants shall be Mueller Centurian or equal.

The Contractor shall provide all trench excavation, backfill, and compaction necessary to install the fire hydrant assemblies and the steam thaw pipes in accordance with the details shown on the plans.

All fire hydrant legs shall be installed level. The fire hydrant barrel shall be installed plumb, and the drain plug shall not be removed prior to installation. The Contractor shall verify that all drain plugs are in place and tighten before acceptance.

Fire hydrants will be adjusted to final grade by the AWWU Operations and Maintenance Division. Contractor shall provide AWWU with a minimum of 72 hours notice, excluding

non-working days, to coordinate fire hydrant adjustment. Contractor shall be responsible for access to the hydrant location and all trench excavation, dewatering, and backfill operations prior to, during, and after the fire hydrants are adjusted by AWWU personnel. The cost for coordinating and providing trenching operations are incidental to the fire hydrant installation.

The Contractor shall paint in 2-inch black lettered stencils, the direction and distances to the nearest 0.1 foot the distance to the valve box on the face of the fire hydrant directly below the bonnet flange.

627-3.04. *Add the following*: Valves shall be installed where shown on the plans. Valves shall have the interiors cleaned of all foreign matter before installation. If the valve is at the end of the line, it shall be plugged prior to backfilling. The valve shall be inspected by the Water Utility's representative, in the open and closed positions to ascertain that all parts are in good working condition.

627-3.05. *Delete the first paragraph and substitute the following*: Valve boxes shall be installed over the valves as shown on the plans, with base section centered over the operating nut of the valve and resting on well compacted backfill. Top section shall be so set as to allow equal movement above and below finished grade, final elevation to be 1/4-inch below finished grade of pavement unless otherwise directed. Top of base section shall be approximately on line with nut at top of valve stem, and the entire assembly shall be plumb.

Add the following after the second paragraph: In areas where running sand is encountered, provisions shall be made to restrict sand from entering the bottom section of the valve box.

The Contractor shall expose all valve boxes for pre-final and final inspection. After final inspection of the valves located in unpaved areas, sawdust shall be poured directly over the valve box lid and covered with gravel to facilitate location in the future.

627-3.06 TESTING WATER SYSTEM. *Delete in its entirety and substitute the following*: The Contractor shall notify the Engineer in writing 48 hours in advance (two working days) prior to any test. The Water Utility and the Engineer shall be present during all tests. Two hours notice in advance of the scheduled time shall be given to the Engineer if the test is to be postponed or cancelled.

Hydrostatic Testing. A hydrostatic test using water main line pressure shall be conducted on all newly-constructed water conduit, fire hydrant leads and stub-outs in the presence of the Engineer and the Water Utility. The method of testing will be determined by AWWU.

627-3.07 DISINFECTION OF WATER LINES. *Delete paragraphs 1 through 4 and add the following*: This subsection applies to the disinfection of all portions of the water system, including all valves and stops and any portion of the existing connection system that might have become contaminated during construction activities. Disinfection shall be accomplished prior to assembling the water and fire hydrant system using a method approved by the Anchorage Water

and Wastewater Utility and protected against contamination during construction of the water system.

627-3.08 AS-BUILT PLANS AND WORKING DRAWINGS. *Add the following subsection*: A complete and accurately dimensioned record of all deviations, deletions, additions and alterations from and to the contract plans and specifications shall be maintained by the Contractor to indicate the work as actually installed. This as-built information shall be recorded on a print of the plans affected and on the applicable pages of the specifications with supplementary notes. This record set of plans and specifications shall be kept by the Contractor showing record conditions of all conduit and appurtenances installed. Conduit and appurtenances shall be referenced by stationing, showing design line and grade, and as-built line and grade.

When each water system is completed, the Contractor shall certify the accuracy of the construction survey notes and of each revision on the plans and in the specifications by written signature endorsement, and deliver them to the Engineer prior to final acceptance of the system by the Water Utility.

627-4.01 METHOD OF MEASUREMENT. *Delete subparagraphs 1 and 5 in their entirety and substitute the following*:

1. Water Conduit. Water conduit, fittings, tees, reducers, crosses, bends, couplings, etc., furnished and installed will not be measured for payment.

5. Valves, Valve Boxes and Markers. Valves, valve boxes and markers furnished and installed will not be measured for payment

Add the following:

6. Adjustment of Valve Box. Measurement will be the number of valve boxes adjusted for final grade only.

627-5.01 BASIS OF PAYMENT. *Delete paragraph 2 in its entirety and substitute the following:*

The contract price for Item 627(5) Fire Hydrant Installation includes removal of existing fire hydrant, fire hydrant valves, 10" AC water main, existing water main fittings and construction of new 10" DIP water main as shown on the plans (to install a new fire hydrant), fittings and fire hydrant assembly with thaw pipes.

Delete this Section in its entirety and replace with the following:

SECTION 639

DRIVEWAYS

Special Provisions

639-1.01 DESCRIPTION. Construct approaches, residential or commercial driveways at the locations shown in the Plans.

639-2.01 MATERIALS. Use materials that conform to the standards for the main roadway.

639-3.01 CONSTRUCTION. Construct driveways and approaches to the dimensions shown on the Plans.

639-4.01 METHOD OF MEASUREMENT. By the number of driveways and approaches constructed as shown on the Plans or as directed. Pavement removal and excavation required beyond the limits of the adjacent mainline will be subsidiary.

639-5.01 BASIS OF PAYMENT. At the contract unit price shown in the bid schedule. The contract unit price for driveways and approaches shall be full compensation for furnishing equipment and labor necessary to complete the work as specified.

Materials required to construct driveways and approaches will be paid for separately under the respective items listed in the bid schedule.

Native material meeting the minimum requirements of Selected Material, Type C will not be paid for directly, but will be considered subsidiary to 639 items.
(05/09/02)R58M98

Payment will be made under:

Pay Item	Pay Unit
639(6) Approach	Each

SECTION 641

EROSION, SEDIMENT, AND POLLUTION CONTROL

Special Provisions

641-1.02 DEFINITIONS.

Item 1. Replace the last sentence with the following:
The Department describes common BMPs in its *Alaska Storm Water Pollution Prevention Plan Guide, June 1, 2004.*

Item 2. Add the following: The ESCP has been included in Appendix A.

Item 5. Replace the last sentence with the following: Use EPA Form 3510-9 (Revised 6/03).

Standard Modification

Item 6. Delete "7" so sentence reads: Use EPA Form 3510-13.
E15(6/30/04)

Special Provisions

Replace subsection 641-1.03 with the following:

641-1.03 SUBMITTALS. *Delete this subsection 641-1.03 and replace with the following:* For projects disturbing 1 acre or more of ground submit three copies each of the SWPPP and HMCP to the Engineer for approval. Submit 1 copy of the SPCC Plan (if required under Subsection 641-2.03) to the Engineer. Sign submittals. Deliver these documents to the Engineer no less than 5 calendar days before the preconstruction conference.

The Department will review the SWPPP and HMCP submittals within 14 calendar days. Submittals will be returned requiring modification or approved by the Department. Besides a copy of the Contractor's NOI, the approved SWPPP must contain a certification and be signed by an authorized representative according to the Standard Permit Conditions of the NPDES General Permit Part 8, Appendix G. The Contractor must receive written notification from the Department that the SWPPP has been approved before submitting the original NOI to EPA. NOIs can be submitted by Certified mail or through EPA's electronic NOI system (eNOI).

For regular U.S. Mail delivery:

EPA Storm Water Notice Processing Center
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

For Overnight/Express mail delivery:

EPA Storm Water Notice Processing Center
Room 7420
U.S. EPA
1201 Constitutional Avenue, NW
Washington, D.C. 20004

For electronic mail, the Contractor must register online with EPA at: *http://cfpub.epa.gov/npdes/stormwater/enoi.cfm*. This website has instructions and guidance on how to set up and use the eNOI system.

Whether submitting the NOI electronically or by mail, do not begin ground-disturbing activities until the Engineer has issued a written statement that the EPA has listed the Contractor's NOI and the Department's NOI as active.

The Department will submit the approved SWPPP to ADEC that will include both the Contractor and Department NOIs.

The active status NOIs, approved SWPPP, approved HMCP, and submitted SPCC Plan (when required) become the basis of the work required for the project's erosion, sediment, and pollution control.

Once the Department has determined the site has achieved final stabilization, the Engineer will provide written notification to that the Contractor's NOT may be submitted to EPA with a copy to the Engineer. The Department will transmit the Department's NOT to the EPA.

641-2.01 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS. *Replace the third sentence with the following*: Follow the format presented in the *Alaska Storm Water Pollution Prevention Plan Guide, June 1, 2004.*

The plan must address site-specific controls and management plan for the construction site as well as for material sites, waste disposal sites, haul roads, and other affected areas, public or private. The plan must also incorporate the requirements of the project permits.

641-3.01 CONSTRUCTION REQUIREMENTS. *Replace the first two sentences with the following:* Do not begin ground-disturbing work until the Engineer provides written notice that both the Contractor's and the Department's NOIs have been listed as active and that ground-disturbing work can begin.

Under the paragraph starting with "Submit a signed NOT to EPA and a copy to the Engineer:" replace items 1 and 2 with the following:

1. When the Engineer has acknowledged in writing that the project site (including material sources, disposal sites, etc.) has been finally stabilized and storm water discharges from construction activities authorized by this permit have ceased, or

2. When the construction activity operator (as defined in the NPDES General Permit) has changed and the Engineer provides written notification that the Contractor's responsibilities with respect to compliance with the NPDES GP on the project have ceased.

(11/23/04)R&M

SECTION 642

CONSTRUCTION SURVEYING AND MONUMENTS

Special Provision

642-3.01 GENERAL *Add the following after Item 10:* Prior to any work on the project, stake and reference the construction centerline. Reference the existing centerline at 100 foot on tangents, and 50-foot intervals on curves from the beginning and ending of superelevation changes when the roadway is no longer at normal crown. Also stake the beginning and ending of tapers of the edge of pavement. The reference stake shall be a minimum of 1 inch by 2 inch by 2 feet and be offset 4 to 8 feet from the shoulder on the right side of the roadway. They shall show the offset distance to centerline and the station from the beginning of the project. Ensure that the stakes are visible from the roadway by clearing as necessary. Maintain staking until the final roadway striping is completed.

Install a reference sign every 500 feet. These reference signs shall meet the following requirements:

1. mounted a minimum of 5 feet above the shoulder,

2. located a minimum of 10 feet from the edge of shoulder,

3. marked with the station from the beginning of the project, in 6 inch high black lettering on an orange background.

Compute design centerline profile to best fit the existing centerline profile and exiting guardrail requirements detailed in Subsection 606-3.11. Prepare existing top of pavement cross-sections for horizontal curves and transitions with design superelevated pavement plotted on each section. The Engineer may require adjustments to the roadway grades. This shall not be considered extra work. Provide this profile information to the Engineer (electronically in Excel format) immediately upon its completion, along with checked computations on all level loops, but in no case later than seven (7) calendar days before slope staking or blue topping.

Where new curb is to be constructed using existing curb layout, reference the existing curb by setting surveyed reference points prior to removing the curb. In addition to setting reference points, as-build the existing curb to obtain the elevation and location information necessary to stake the new curb in case the reference points are disturbed or damaged. Where new manholes are to be constructed and connected to the existing storm drain system, obtain pipe size, type, and invert elevations at existing manholes so that pipe elevations at new manholes can be determined. Where new manholes will be installed between existing manholes, obtain pipe elevations at the existing manholes on both sides of the bisected pipe. Submit pipe elevations to the Engineer prior to fabricating manholes.

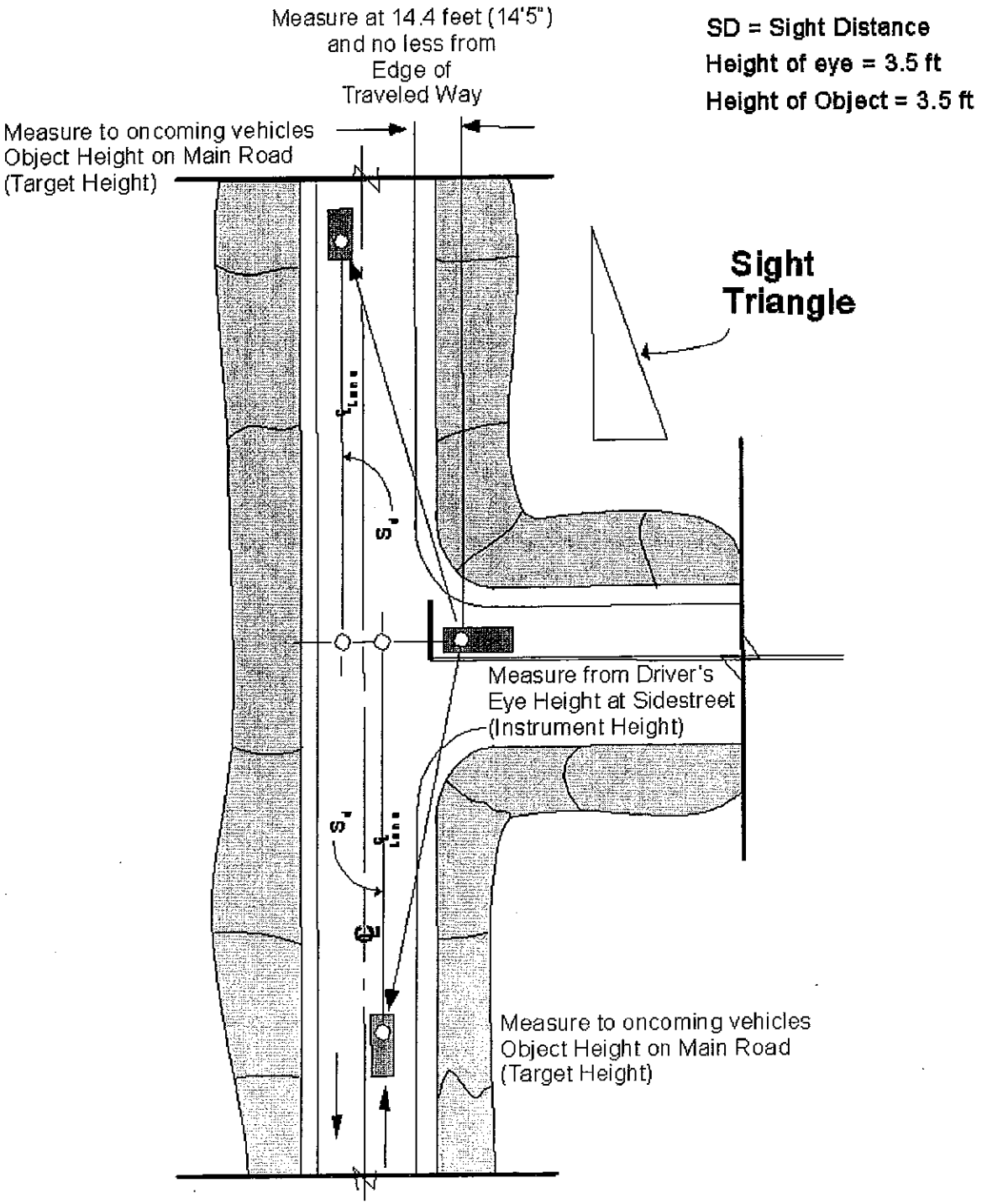
The frequency of surveyed reference points and as-built survey data shall be in accordance with the Department's "Construction Surveying Requirements".

Add the following items after Item 10:

11. Measure and document the actual intersection sight distance triangles at all public intersections and driveways. Measure this after all paving, guardrail, and other work affecting intersection sight distance has been completed. List the actual sight distance available up to 650 feet. Note locations with greater than 650 feet of sight distance as "650'+". Measure sight distance triangles as shown in the following figure by setting up an instrument at the driver's eye location. Provide the results in a table format as shown. Include remarks in a "notes" column, relating any minor obstacles or observations which may assist in improving sight distance. Certify and record the results on standard "letter" sized paper and provide two copies to the Engineer at least two (2) weeks prior to submitting shop drawings for permanent signing. The Engineer will forward one (1) copy to the Regional Traffic Engineer. The Regional Traffic Engineer's office will take up to two (2) weeks to review and require any additional warning signs for intersections or driveways as needed. (02/18/04)R269USC (11/23/04)R&M

12. Cross sections at retaining wall locations. Provide the Engineer cross section data, taken at 25-foot intervals, 10 days before ordering retaining wall materials. The Engineer will verify the plan quantity and make any necessary adjustments to the wall size, design or configuration. (11/18/02) R255USC

INTERSECTION SIGHT DISTANCE SURVEYING



Intersection Sight Distance Survey Table

ROAD NAME: _____

Stationing FROM: _____ DATE: _____

TO: _____ Surveyor: _____

Public Approach or Estimated Driveway Station	Posted Speed Limit	Sight Distance Back	Sight Distance Ahead	Remarks

Other Notes:

1.
2.
3.

Accepted By: _____ Date: _____

Municipal Project Engineer

Intersection Warning Signing

Review Checked By: _____ Date: _____

Municipal Traffic Engineer

642-3.03 MONUMENTS. *Delete the second sentence of the first paragraph and substitute the following:*

Reference property markers/corners, monuments or accessories which may be disturbed or buried during construction. Prepare and record Monument Record Forms in the appropriate Recorder's Office before disturbing monuments. Monument Record Forms may be obtained from the Engineer. Reestablish monuments in their original position before the completion of the Project. Then, prepare and file a Monument Record Form for each reestablished monument.

642-4.01 METHOD OF MEASUREMENT. *Add the following:*

Clearing required for stake visibility shall not be measured. Maintenance of stakes will not be measured.

Item 642(15) Intersection Sight Distance Measurement. By each intersection measured, only after the Engineer has accepted the certified and recorded results.

642-5.01 BASIS OF PAYMENT. *Add the following after the first paragraph:*

Where the bid item for Reference Existing Monument does not appear in the bid schedule, work necessary to reference existing monuments and prepare and file Monument Record Forms is subsidiary to Item 642(1) Construction Surveying. Five (5) percent of the contract lump sum bid price for Item 642(1) will be withheld until the Monument Record Forms are prepared and recorded in the local Recorder's Office. Where the bid item for Reference Existing Monument does appear in the bid schedule, work associated with preparing and recording the Monument Record Forms is subsidiary to Item 642(9) Reference Existing Monument. Payment will not be processed payment of Item 642(9) until the Monument Record Forms are prepared and recorded in the local Recorder's Office.

Clearing required for stake visibility is subsidiary to Item 642(1) and no separate payment shall be made.

Add the following pay items:

Pay Item	Pay Unit
642(15) Intersection Sight Distance Measurement	Each

(02/18/04)R269USC

SECTION 643

TRAFFIC MAINTENANCE

Special Provisions

643-1.01 DESCRIPTION. *Add the following as a third paragraph:*
Illuminate construction activities listed in Table 643-2 during hours of night work on roads open to the public within project limits.

643-1.02 DEFINITIONS. *Add the following paragraphs after paragraph titled "Construction Phasing Plan":*

Balloon Light: Light surrounding by a balloon-like enclosure kept inflated by pressurized air or helium, and producing uniform light through 360 horizontal degrees. The top half of the balloon enclosure shall be constructed of an opaque material.

Night Work: Work occurring between sunset and sunrise on all days except:

Latitude (degrees)	No Lighting Required		Nearby Cities
	Start	End	
< 61	No Exclusions		Everything S of Soldotna
61	June 11	July 1	Anchorage, Valdez
62	June 2	July 13	Wasilla, Palmer, Glennallen
63	May 27	July 17	Cantwell
64	May 22	July 21	Delta Junction
65	May 18	July 25	Fairbanks
66	May 14	July 29	Circle
67	May 10	August 2	Coldfoot
68	May 7	August 6	
69	May 3	August 9	
70	April 30	August 12	Deadhorse
71	April 27	August 15	Barrow
72	April 24	August 19	

643-1.03 TRAFFIC CONTROL PLAN. *Replace the last paragraph with the following:* A waiver may be requested of regulation 17 AAC 25 regarding oversize and overweight vehicle movements within this project in writing. If the waiver is approved, movements of oversize and overweight vehicles in or near traffic within the project limits will be done according to the provisions of an approved Traffic Control Plan. Maintain a minimum12 foot lateral separation between the non street legal vehicles and the motoring public. The Traffic Control plan shall specify the traffic control devices required for these operations.

643-1.04. WORKSITE SUPERVISOR. *Add the following to Item 2. Duties:*

i. Supervise lighting of Night Work.

Add the following new subsection:

643-1.07 STATIC FIELD LIGHTING TEST. Before work begins, do a static layout of construction and lighting equipment meeting light level requirements in Table 643-2. Tell the Engineer when the test will be conducted. Conduct the test in an area where existing artificial illumination will not increase light readings. Wait until after dark and turn on all lights. The Engineer will measure the minimum horizontal illuminance levels at the locations specified in Table 643-2. In addition, the Engineer or designee will determine whether the system produces too much glare. Modify the system to provide the required illuminance level, uniformity, and glare mitigation.

Take meter readings at roadway surface level.

643-2.01 MATERIALS. *Under Item 16. Flagger Paddles, add the following last sentence:* During night work use flagger paddles that meet the criteria of this paragraph, except use reflective sheeting that is "diamond grade" sheeting or approved equivalent.

Add the following:

17. Flexible Markers. Refer to subsection 606-2.01 Materials.

Standard Modifications

643-3.01 GENERAL CONSTRUCTION REQUIREMENTS. *Add the following:* Immediately notify the Engineer of any traffic related accident that occurs within the project limits as soon as you, an employee, or a subcontractor becomes aware of the accident.
(02/05/04)E10

Special Provision

Whenever construction activity encroaches onto the safe route in a traffic control zone, station a flagger at the encroachment to assist pedestrians and bicyclists past the construction activity.

643-3.02 ROADWAY CHARACTERISTICS DURING CONSTRUCTION. *Add the following:* Traffic may be maintained on a continuous gravel surface for 1,000 feet.

Pave lanes next to the median first. Pave lanes next to exit and entrance ramps last. Place a 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.

Maintain a paved surface for vehicular traffic at all times.
(5/12/04)R&M

Standard Modifications

643-3.04 TRAFFIC CONTROL DEVICES.

In the sixth paragraph, and also in Item 4.b. delete the words "ATTSA" *and replace with* "ATSSA" American Traffic Safety Services Association.
E16(6/30/04)

Special Provision

Delete the first sentence of the eighth paragraph and substitute the following: Items paid under this Section remain the Contractor's property unless stated otherwise.

Add the following to 1. Embankments.: Close trenches and excavations at the end of each continuous work shift.

Add the following to 3. Fixed Objects.: Remove obstructions greater than 4 inches above the nominal foreslope grade at the end of each continuous work shift.

Delete item 6 and replace with the following:

6. Street Sweeping. 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 using a street sweeper that can collect materials rather than eject them to the shoulder of the road.

7. 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 using a power broom that can eject them to the shoulder of the road.

Change items 7 and 8 to 8 and 9 respectively.

Add the following:

10. ET-2000 LET. The price listed in the Traffic Control Rate Schedule will be full compensation for the purchase, installation, maintenance during construction, removal and salvaging the ET-2000 LET unit(s). Deliver the salvaged unit(s) to the nearest DOT &PF Maintenance and Operations' district office, or as directed by the Engineer.

643-3.05 AUTHORITY OF THE ENGINEER. *Add the following after the second sentence*: In no case shall this time exceed 24 hours.

643-3.06 TRAFFIC PRICE ADJUSTMENT. *Add the following:* Traffic Price Adjustment will also apply to unacceptable driving conditions, such as severe bumps, "washboarding," potholes, excessive dust or mud, or dirty or out of place traffic control devices. The Engineer will make the sole determination as to whether the roadway or pedestrian facility is acceptable for full unimpeded use by the public. 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 643-1, for the time that the roadway or pedestrian facility is in an unacceptable condition.

Delete Table 643-1 and substitute the following:

TABLE 643-1
ADJUSTMENT RATES

Published ADT	Dollars/Minute of Delay/Lane
0-4,999	$10
5,000-9,999	$30
10,000+	$40

643-3.08 CONSTRUCTION SEQUENCING. *Delete the last sentence and substitute the following:* Unless otherwise determined by the Engineer and on an approved Traffic Control Plan (TCP), do not restrict traffic during the times listed below.

1. Friday from 1200 hours to Sunday 2300 hours

2. Around any holiday:

   a. If a holiday falls on Sunday, Monday or Tuesday, the above stipulations apply from 1200 on the Friday before the holiday to 0300 on the day after the holiday.

   b. If a holiday falls on Wednesday, the above stipulations apply from 1200 on the Tuesday before the holiday to 0300 on the Thursday after the holiday.

   c. If a holiday falls on Thursday, Friday or Saturday, the above stipulations apply from 1200 on the day before the holiday to 0300 on the Monday after the holiday.

Delete the last sentence and substitute the following:

Unless otherwise determined by the Engineer and on an approved Traffic Control Plan (TCP), do not restrict traffic during the times listed below:

1. 0600 hours to 0800 hours, Monday through Friday (Labor Day excluded).
2. 1600 hours to 1800 hours, Monday through Friday (Labor Day excluded).
3. Around any holiday:

a. If a holiday falls on Sunday, Monday or Tuesday, the above stipulations apply from 1200 on the Friday before the holiday to 0300 on the day after the holiday.

b. If a holiday falls on Wednesday, the above stipulations apply from 1200 on the Tuesday before the holiday to 0300 on the Thursday after the holiday.

c. If a holiday falls on Thursday, Friday or Saturday, the above stipulations apply from 1200 on the day before the holiday to 0300 on the Monday after the holiday.

The Contractor shall obtain a Noise Permit for doing night work and shall comply with the conditions and restrictions of the permit. Night work shall mean from 2000 hour to 0600 hour Monday through Sunday.

In areas of the project where traffic is maintained through the Work Zone, the minimum lane width allowed shall be 10 feet.

Single lane closures shall be used for the following work:
Curb or sidewalk removal and replacement.
Catch basin removal and replacement and upgrades.
Detector replacement.

Written 48 hour notice shall be hand delivered to the tenant prior to construction of driveway approaches.

One weekend closure will be allowed for the following three segments: DeBarr Road to 8th Avenue, 8th Avenue to 4th Avenue, 6th Avenue to the Glenn Highway.

Weekend work shall mean from 2000 hour Friday to 0600 hour Monday. Independence Day and Labor Day are included in the weekend.

Vehicular access to driveways must be maintained at all times. A two hour closure will be allowed during paving operations. Written 48 hour notice shall be hand delivered to the tenant prior to driveway closure.

Sequencing: It is anticipated the following construction Sequencing Plan will be used by the Contractor.

1. Remove and replace inlets, edge curb and gutter, sidewalks and ramps.
    a. Close affected traffic lane in accordance with TCP.
    b. Remove and install new inlets.
    c. Remove existing curb and sidewalk, prep for new edge curb and sidewalk.
    d. Install new curb and gutter, ramps and sidewalk.
    e. Protect new curb with traffic control devices.
2. Remove and replace median curb and gutter.

a. Close affected traffic lane in accordance with TCP.
b. Remove existing curb and prep for new curb.
c. Install new curb.
d. Protect new curb with traffic control devices.

3. Construct left turn lane at 4th Avenue.
    a. Close affected traffic lane in accordance with TCP.
    b. Construct embankment, curb and gutter, ramps and sidewalk.
    c. Construct new entrance.
    d. Remove existing asphalt and pave first lift.
    e. Construct median, remove remaining asphalt and pave first lift.
4. Extend right turn lane at DeBarr intersection.
    a. Close affected traffic lane in accordance with TCP.
    b. Construct embankment, curb and gutter, ramps and sidewalk.
    c. Construct new entrance.
5. Extend right turn lane at DeBarr intersection.
    a. Close affected traffic lane in accordance with TCP.
    b. Construct new pavement section and install curb.
6. Paving and traffic detectors between DeBarr and 8th Avenue.
    a. Close road section in accordance with TCP.
    b. Remove pavement northbound lanes and portion of southbound lanes.
    c. Pavement plane southbound lanes.
    d. Install traffic detectors.
    e. Pave first lift.
    f. Pave final lift.
7. Paving and traffic detectors between 8th Avenue and 4th Avenue.
    a. Close road section in accordance with TCP.
    b. Remove pavement through intersection.
    c. Pavement plane remaining area.
    d. Install loops.
    e. Pave first lift.
    f. Pave final lift.
8. Paving and traffic detectors between 6th Avenue and Glenn Highway.
    a. Close road section in accordance with TCP.
    b. Pavement plane remaining area.
    c. Pave final lift.
9. Striping
    a. Close affected traffic lane in accordance with TCP.
    b. Stripe project using lane closures.

Pedestrian Traffic: Contractor shall provide and maintain a pedestrian traffic route through the project for the duration of the project or until a permanent pedestrian walkway has been completed. The route shall be signed and delineated such that it is obvious and recognizable to the pedestrian. It shall be established in a location within the project limits, at a distance which will help to eliminate interference between pedestrians and construction operations. The location of the route may change throughout the duration of the project, depending on locations of construc-

tion operations, and each location shall be approved by the Engineer. Safety fencing shall be required along the pedestrian route as necessary to separate work zone from the pedestrian route.

Lane restrictions, if allowed shall be conducted so that no more than a 10 minute accumulated stopped delay, 40 vehicles, or ¼ mile (1,320 feet) of traffic is detained, whichever occurs first, before releasing the detained motorists. During paving operations a 20 minute stopped delay, 80 vehicles, or ½ mile (2,640 feet) of traffic detained, will be allowed for motorists except school buses. If a queue of traffic develops at a stop, the entire queue must be emptied to include the last car that entered the queue at the time the queue was released.

Obtain the local school bus schedule and coordinate his work efforts to ensure the school buses are not delayed through the construction zone. This plan shall be submitted, as a TCP, to the Engineer for approval before the implementation of the school bus coordination plan.

643-3.09 INTERIM PAVEMENT MARKINGS. *In the second paragraph, delete the words "or cover them with black removable preformed marking tape."*

Replace the first sentence in the last paragraph with the following: Apply final pavement markings according to Subsection 670-3.01, Construction Requirements of these Special Provisions.

Add the following new Subsections:

643-3.10 PUBLIC INFORMATIONAL PROGRAM. Provide a Public Information (PI) professional to accomplish the work outlined in this subsection. The PI person shall have a minimum of five (5) years demonstrated professional experience in performing similar informational campaigns involving multi-media, ie: television, radio, newspaper and public presentations. The person shall be responsible for aspects of this service including coordination; public interaction; preparing graphics; developing mailing lists; supplying updated information; and labor, equipment, postage, and materials to provide this service. Logos, reports, software, visual aids, graphics and work products developed for this Project shall become the property of the Department, and delivered to the Engineer at the end of the work. The PI professional's office shall be equipped with a facsimile machine.

This professional shall be responsible for the following tasks for the PI Program:

1. Mail-outs. Design and distribute three informational mail-outs/flyers each construction season, which will be approved by the Engineer. The mail-outs shall contain most or the following:

    a. a brief description and map of the Project,
    b. the Contractor's anticipated construction schedule,
    c. a narrative of the possible delays to the traveling public through the Project,
    d. detailed traffic information such as intersection, lane and/or sidewalk closures, their corresponding detours, and their effective dates,
    e. locations of temporary bus stops,

f. a description of possible impacts to abutting property accessing the Project,

g. a listing of locations where current Project information may be obtained,
h. date and times of Open House meeting as required by the Engineer,
i. the Contractor's 24-hour message number and office telephone number, and
j. the Engineer's Project office telephone number, e-mail address, and the web site address containing Project updates, schedules and general narrative information.

The last mail-out shall also contain a questionnaire to aid in preparing the final Report required under item 5 below.

The mail-outs shall be sent to addresses within one city block on either side of the Project corridor, and shall be addressed to both the owner of record and the current tenant. It shall be distributed at the following times:

a. two (2) weeks before construction begins,
b. at the approximate one-third point of construction season, and
c. at the approximate two-thirds point of construction season.

2. Weekly Notices. Write and submit weekly Public *Information Notices* identifying road closures, restrictions to traffic, and detours. Areas of potential traffic delay shall be emphasized and alternative routes noted. Coordinate this effort with the Engineer and the Department's *NAVIGATOR Informational Program.* Telephone numbers for further information, and the date and time for the next scheduled public open house meeting shall be provided. The Engineer will approve the Notices. Hand carry or fax the Notices to the local news broadcasting media, emergency services, public service organizations and the major retailers near the Project corridor.

Notices shall also be distributed to the following local officials and transportation organizations, including but not necessarily limited to:

Alaska Carriers Association
Alaska Trucking Association
Alaska State Troopers
Anchorage Police Department
Anchorage Fire Department
Anchorage School District
People Mover Transit Authorities
Local Emergency Medical Services
US Postal Service

The Notices shall be submitted at the following times:

a. one (1) week before to the beginning of construction,
b. on Wednesday of each week during construction, and

c. before major change or disruption to traffic or local access.

Additionally, the PI professional shall notify business and residents that front the Project or scheduled road closures or of driveway, curb or sidewalk reconstruction, or any other work affecting them. Property owners within the work segment shall receive the Notices a minimum of one (1) week before beginning the work within their segment. Lastly, provide daily information to those media who do non-paid public service road reports or announcements, and/or "Eye-in-the-Sky" commuter road reporting.

3. Public Open House Meetings. Prepare presentations for the Engineer's *Open House Meetings,* and for of each of the Community Councils that represent areas affected the this Project. The Community Council meetings attended shall be the last regularly scheduled meetings before beginning construction. Presentation size graphics shall be used to help explain the Project to the general public.

The PI professional shall be the Contractor's representative and spokesman, able to speak for him. The PI professional shall be available to attend additional public meetings, up to five (5), as requested by the Engineer.

4. Other Agency Coordination. Coordinate with the Anchorage *People Mover* Transit Department (907-343-8294) to take advantage of programs which will help decrease traffic through this Project, such as Park-and-Ride with express bus service, Ride Share, and the car pooling program. Also coordinate major detours and closures with emergency service providers (police, fire, and ambulance), Anchorage School District bus operators, postal service, and the *People Mover.*

5. Final Report. Before Project completion, submit a Report evaluating the Public Informational Program as detailed under this Subsection. The Report shall include an outline of the program, an analysis of the program's effectiveness, and suggestions on how to improve the program's effectiveness, economy, and usefulness on future projects.

6. Project Progress Meetings. Attend scheduled or special Project meetings between the Contractor and the Engineer at the field office.

7. Web Page. Generate an INTERNET web site for the Project containing Project updates, schedules and general narrative information. Add links to the Department's *NAVIGATOR* Home Page (www.dot.state.ak.us/navigator.html). Update the site weekly. (05/01/03)R102M98

Standard Modifications

643-3.11. HIGH VISIBILITY CLOTHING. Ensure all workers within project limits wear an outer visible surface or layer that complies with the following requirements:

1. Tops.

Wear fluorescent vests, jackets, or coverall tops conforming to Class 2 at all times. Class 2 requires at least 775 square inches of conforming fluorescent red-orange background material and at least 201 square inches of conforming retroreflective striping. Retroreflective striping shall be fluorescent yellow-green combined-performance material.

The vest, jacket, or coverall top shall have two over the shoulder combined-performance retroreflective stripes, and at least one 360-degree horizontal combined-performance retroreflective stripe around the torso. Jackets and coverall tops shall have two horizontal combined-performance retroreflective bands on each sleeve; one above and one below the elbow.

2. Bottoms.
   Wear fluorescent red-orange Class E pants or coverall bottoms during nighttime work (sunset to sunrise). Flaggers shall wear fluorescent red-orange Class E pants or Class E coverall bottoms at all times. Furnish each garment with two 2-inch wide combined-performance fluorescent yellow-green retroreflective horizontal stripes on each leg.

3. Raingear.
   Raingear tops and bottoms, when worn as the outer visible surface or layer, shall conform to the requirements listed above in (1) Tops and (2) Bottoms.

4. Exceptions.
   When workers are inside an enclosed compartment of a vehicle, they are not required to wear high visibility clothing.

5. Standard.
   All high visibility garments shall conform to the requirements of ANSI 107-1999 as well as this specification. Class 2 and Class E garment requirements are defined in that standard. All retroreflective material must also qualify as combined-performance fluorescent material.

6. Labeling.
   All garments shall be labeled in conformance with Section 10.2 of ANSI-107-1999.

7. Condition.
   Furnish and maintain all vests, jackets, coveralls, rain gear, hard hats, and other apparel in a neat, clean, and presentable condition.

(12/02/03)E07

Special Provision

643-3.12 LIGHTING OF NIGHT WORK.

Illuminate the night work areas specified in Table 643-2 to the light levels specified.

Table 643-3 does not provide a comprehensive list of operations that require lighting. Provide lighting for other operations when necessary.

Table 643-2 Night Work Illumination Level and Area of Coverage

Type of Work/ Equipment	Lighting Configuration	Minimum Illumination (footcandles)	Area of Illumination	
			Length (along road)	Width (across road)
Paving, Milling, Striping, Pavement Marking Removal, Rumble Strip Installation	At least 2 machine-mounted balloon lights with a total wattage of at least 4000 watts. Provide additional lights or wattage to meet illumination and area requirements.	5	15' beyond front and back of machine	15' beyond both sides of machine
		1	30' beyond front and back of machine	30' beyond both sides of machine
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.	5	20' beyond front and back of roller	Not specified
Flagging	One light plant with 4 - 1000 watt metal halide lamps illuminating the flagger located within 50' of flagger. Orient to avoid creating glare for drivers.	Not specified	Not specified	Not specified
Truck Crossings (meaning where haul vehicles cross or enter a road): 1) with roads with ADTs over 10,000 or 2) that are controlled by portable signals or flaggers	One light plant with 4 - 1000 watt metal halide lamps located in a manner that will illuminate haul vehicles approaching the crossing. Orient to avoid creating glare for drivers. If it is not possible to illuminate both the flagger and haul vehicles at flagger controlled crossings, provide an additional light plant of the same type.	Not specified	Not specified	Not specified

When Table 643-2 gives the option of balloon lights or light plants, use balloon lights where possible – they provide uniform light with minimal glare.

The Engineer may verify illuminance levels and uniformity at any time using a handheld light meter.

Install lighting in a manner that minimizes glare for motorists, workers, and annoyance or discomfort for residents living along the roadway. Locate, aim, louver, and/or shield light sources to achieve this goal.

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 eliminate it.

If the Contractor fails to meet required illuminance levels or provides lighting that creates unacceptable glare at any time, the Contractor shall cease nighttime operations in that area until the condition is corrected.

Lighting equipment shall be in good operating condition and in compliance with applicable OSHA, NEC, and NEMA codes.

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 and to provide the required illuminance. 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.

Ground, trailer, and equipment-mounted light towers shall be sturdy and freestanding without the aid of guy wires. Towers shall be capable of being moved to keep pace with the construction operation. Position 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.

Ensure that trailer or equipment mounted light towers do not exceed the height of overhead objects such as 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 machines uniformly.

Conventional vehicle headlights do not eliminate the need for the Contractor to provide lighting. 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.

Existing street and highway lighting do not eliminate the need for the Contractor to provide lighting.

Provide sufficient fuel, spare lamps, spare generators, and qualified personnel to ensure that 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 failure of the lighting system, discontinue the operation until the required level and quality of illumination is restored.

Maintain a supply of emergency flares for use in the event of emergency or unanticipated situations.

Provide NCHRP 350-compliant breakaway bases for post-mounted electroliers located within the clear zone.

Standard Modifications

643-4.01 METHOD OF MEASUREMENT. *Add the following:* Payment for high visibility clothing for workers is subsidiary to other items.
(12/02/03)E07

Special Provision

Add the following:

16. Work Zone Illumination. Payment for work zone illumination is subsidiary to other items.

R276USC04(11/29/04)

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 Item 643(1) or 643(2), Traffic Maintenance.

Providing mail-outs, notices, displays for open house and public meetings, and providing weekly notices with updates will not be measured for payment. (05/01/03)R102M98

643-5.01 BASIS OF PAYMENT. *Delete the first paragraph under Item 1 Traffic Maintenance and replace with the following*: The contract price includes all resources required to provide the Worksite Traffic Supervisor, all required TCPs, the Construction Phasing Plan, and the maintenance of all roadways, approaches, crossings, intersections and pedestrian and bicycle facilities, as required.

Add the following: The Engineer does not require a change order/directive for Item 643(25) Traffic Control.

TRAFFIC CONTROL RATE SCHEDULE

Traffic Control Device	Pay Unit	Unit Rate
Construction Signs	Each/Day	$5.00
Special Construction Sign	Square Foot	$20.00
Type II Barricade	Each/Day	$ 3.00
Type III Barricade	Each/Day	$ 10.00
Traffic Cone or Tubular Marker	Each/Day	$ 1.00
Drums	Each/Day	$ 3.00
Sequential Arrow Panel	Each/Day	$55.00
Portable Concrete Barrier	Each	$60.00
Temporary Crash Cushion / ET-2000 LET	Each	$3,000.00
Pilot Car	Hour	$65.00
Watering	M-Gallon	$ 20.00
Street Sweeping	Hour	$150.00
Power Broom	Hour	$75.00
Plastic Safety Fence	Foot	$2.50
Portable Changeable Message Board Sign	Calendar Day	$150.00
Temporary Sidewalk Surfacing	Square Foot	$1.15
Flexible Markers	Each	$50.00
Removal of Pavement Markings	Foot	$1.25
Temporary Guardrail	Foot	$21.00
Interim Pavement Markings		
Painted Markings	Foot	$0.30
Removable Preformed Markings	Foot	$0.65
Temporary Raised Pavement Markings	Each	$0.75
Word or Symbol Markings	Each	$40.00

The Engineer will pay for Item 643(15), Flagging on a contingent sum basis at the rate of $36.00/hour. The Engineer does not require a change order/directive for the flagging pay item. Flagging associated with Change Order work will be paid at the prices agreed to in the Change Order, or on a time and materials basis according to subsection 109-1.05. (07/02/03)R222USC02

Payment for Item 643(31) will be made on a contingent sum basis for work completed and accepted by the Engineer.
(05/01/03)R102M98 (11/24/04)R&M

Delete Item 643(15) and add the following pay items:

Pay Item	Pay Unit
643(15) Flagging	Contingent Sum
643(31) Public Informational Program	Contingent Sum

SECTION 644

SERVICES TO BE FURNISHED BY THE CONTRACTOR

Special Provision

644-2.01 FIELD OFFICE. *Delete this Subsection in its entirety and substitute the following:*

Furnish and maintain a suitable office for the Engineer, available for occupancy from two (2) weeks prior to commencing work, through thirty (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 1,000 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 six (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. Four (4) telephone service lines available at the office location.

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. The Engineer's office shall be accessible by disabled individuals from the designated handicap parking space in accordance with the requirements of Americans with Disabilities Act Accessibility Guidelines (ADAAG).

11. Weekly janitorial service consisting of emptying trash receptacles, vacuuming office area and cleaning restrooms and counter areas.

12. Provide one mobilization and one demobilization of the Engineer's office equipment and furniture.

644-2.02 FIELD LABORATORY. *Delete sub-item g of Item 2 and substitute the following:*

g. 500 gallon capacity tank with a pressure pump or a commercial pressurized system.

Add the following:

7. 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.

8. Provide one mobilization and one demobilization of the Engineer's laboratory equipment.

644-4.01 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 Item 644(2) Field Laboratory. (11/19/02)R63USC

SECTION 646

CPM SCHEDULING

Special Provision

646-2.01 SUBMITTAL OF SCHEDULE.

Replace this Subsection with the following:

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 item 2, 60-Day Preliminary Schedule.

Delete the first sentence of item 3, Schedule Updates, and substitute 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.

(12/13/02)R261M98

Add the following Section:

SECTION 647

EQUIPMENT RENTAL

Special Provision

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 operations shall be according to the Engineer's instructions. The Engineer's instructions shall be to the Contractor's supervisory personnel only, not to the operators or laborers. In no case shall the Engineer's instructions be construed as making the Department liable for the Contractor's responsibility to prosecute the work in the safest and expeditious manner.

647-2.01 EQUIPMENT FURNISHED.

In the performance of this work, 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 when, in the opinion of the Engineer, the condition is below that normal for efficient output and production.

Equipment shall be fully operated, which shall 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, the Contractor's employees.

Furnish, without direct compensation, a job superintendent or the Contractor's representative together with 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, furnish without direct compensation, transportation as 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.

Furnish equipment, tools, labor, and materials in the kinds, number, and at times directed by the Engineer and shall begin, continue, and stop the operations involved in the work only as directed by the Engineer.

Normally, the work is to be done when weather conditions are reasonably favorable, six (6) days a week, Mondays through Saturdays, holidays excepted.

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 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.

The number of hours of equipment operation to be paid for shall be the actual number of hours each fully operated specified unit of equipment, or each fully operated specified combination of units of equipment, is actually engaged in the performance of the specified work on the designated areas according to the instruction of the Engineer. The pay time will not include idle periods, and no payment will be made for time used in oiling, servicing, or repairing of equipment, or in making changeovers of parts to the equipment. Travel time to or from the project, will not be authorized for payment.

647-5.01 BASIS OF PAYMENT.

Payment for Item 647(1) will be paid on a contingent sum basis at the rate of $125/hour on a per hour basis. This shall be full compensation for furnishing, operating, maintaining, servicing and repairing the equipment, and for all incidental costs related to the equipment. Furnishing and operating of equipment of heavier type, larger capacity, or higher horsepower than specified will not entitle you to any extra compensation.

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Payment will be made under:

Pay Item	Pay Unit
647(5) Rubber-Tired Backhoe, 45 HP Minimum	Contingent Sum

Delete this Section in its entirety and substitute the following:

SECTION 660

SIGNALS AND LIGHTING

Special Provisions

660-1.01 DESCRIPTION. Furnish and install, modify, remove, or salvage one or more traffic signal systems, highway lighting systems, electrical equipment on structures, partial installations for future systems, or combinations thereof, as specified.

Where an existing system is to be modified, reuse the existing material in the revised system as shown on the Plans or specified in the Special Provisions, and salvage or dispose of other materials.

When required by the Special Provisions, provide an on-site manufacturer's representative to:
1. Turn on and adjust the electrical system.
2. Provide acceptable instruction for the operation and maintenance of the electrical system.

660-1.02 DEFINITIONS. Use the definitions in NEMA TS 2-1992, *Traffic Control Assemblies*, Section 1, Definitions, along with the following:

Electrolier. The complete assembly of pole, mast arm, luminaire, ballast, and lamp.

Luminaire. The assembly that houses the light source and controls the light emitted from the light source. Luminaires consist of hood (including socket), reflector, and glass globe or refractor.

Lighting Standard. The pole and mast arm that supports the luminaire.

Vehicle. Motor vehicle licensed for highway use by the State of Alaska.

660-2.01 MATERIALS. Use materials that conform to Section 740, the Materials Certification List, the Plans, specifications, and the following:

Concrete	Section 501 (Class A)
Grout	Subsection 701-2.03
Reinforcing Steel	Section 503
Paint	Subsection 708-2.01
Steel Pipe Pile	Section 715
Anchor Plate	ASTM A 709
Galvanizing	Subsection 716-2.07

1. Equipment List(s) and Drawings. Within 30 days after the Contract award, submit 8 collated copies of a portfolio of equipment and materials proposed for installation to the Department for review and approval. Include a table of contents in the portfolio(s) that includes each item's intended use(s) and the following:

   a. Materials on the *Approved Products List*: The Approved Products List does not apply to the 660 items. Provide catalog cuts of materials to the Engineer for review and approval.

   b. Materials Not on the *Approved Products List*: Catalog cuts that include the manufacturer's name, type of product, size, model number, conformance specifications, and other data as may be required, including manufacturer's maintenance and operations manuals, or sample articles.

   c. Pole Package. A complete set of design, fabrication, and installation proposals for each signal and lighting pole. Include stamped engineering calculations, shop drawings, welding plans, equipment lists, and pole installation plans.

   d. Materials Not Requiring Certification: Incidental materials incorporated into the work (nuts, ties, bolts, washers, etc.) must meet applicable Specifications and be installed according to manufacturer's recommendations. Certification is not needed unless required by the Special Provisions or requested by the Engineer.

2. As-Built Plans. Prepare 3 complete sets of red lined as-built plans and keep them current with the construction. Detail in the as-built plans construction changes made to the Plans. Include the following information on the appropriate sheets:
   a. Location and depth of conduit runs
   b. Station and offset of junction boxes
   c. Heights of signal faces and overhead signs
   d. A list of equipment, including manufacturer, brand, and model number installed in each controller cabinet

   Furnish copies of the as-built plans at least twice a month during construction so that they may be reviewed for accuracy and completeness. Furnish additional information required to clarify the as-built plans and correct discrepancies. The Department will not make progress payments for the signal and illumination work completed until reviewing accurate as-built plans reflecting the construction progress. Correct deficiencies before payment.

   Before final inspection of the work, submit 3 complete sets of as-built plans to the Engineer. Two (2) colored copies of the as-built plans may be submitted in lieu of keeping the 3 separate original copies. If this option is chosen a sample of the method of copying must be approved before starting work on the signal and lighting items.

The Engineer will deliver one copy each to MOA Traffic Department Signals Section; MOA Street Lighting Maintenance; and attach the appropriate sheets of the last set in clear plastic envelopes to the inside of each controller assembly and load center.

3. Warranties, Guarantees, and Instruction Sheets. Deliver to the Engineer manufacturers' warranties, guaranties, instruction sheets, and parts furnished with materials used in the work before the Department assumes maintenance responsibilities.

CONSTRUCTION REQUIREMENTS

660-3.01 GENERAL.

1. Scheduling of Work. Complete each new traffic signal system, highway lighting system, and sign illumination system and ensure it is ready for operation before opening to traffic the corresponding section of new alignment.

   Do not place traffic signal systems in operation until the street lighting is energized at controlled intersections.

   Install detector loops and underground conduit before applying new pavement.

   Do not pull conductors into conduit until junction boxes are set to grade, crushed rock sumps are installed, grout is placed around the conduit, and metallic conduits are bonded.

2. Safety Precautions. Before starting work on existing street lighting circuits, de-energize the system by opening disconnect switches, and/or opening bypass switch plugs, and tagging each opened device as detailed in Part 4, Section 44, Article 440 of NESC. Where said circuits are under the control of an electric utility, obtain written assurance daily from the utility that the circuit being worked on has been de-energized.

   Post suitable-signs at load centers when circuits from that load center are being worked on.

   Pedestrian signals are usually arranged in pairs at a crosswalk. Ensure that you only disconnect one pedestrian signal per pair at one time. Failure to do so will cause the intersection to automatically begin flashing operation.

3. Excavating and Backfilling. Complete all excavation and backfill required to install the signal and lighting components embedded in the roadway as shown in the Plans, including foundations, conduits, junction boxes, and loop detectors. Complete this work according to the requirements of Section 643. Place excavated materials where it will not interfere with surface drainage.

   Support and protect conduits and utilities scheduled to remain in service when you encounter them during excavation.

Excavate trenches wide enough to install the number of conduits specified side by side, to provide clearances of at least 2½ -inches around two-inch conduits and at least two-inches around conduits larger than two-inches, and to compact the bedding and backfill materials according to these specifications.

To install conduits, excavate trenches deep enough to allow for six inches of bedding material, the depth of the largest conduit, and the minimum burial depth specified between the top of the conduit and finished grade of the ground above the conduit. Keep the longitudinal profile of trench bottoms free of irregularities that would prevent the assembled conduit run from continuously contacting the top of the bedding material.

Dispose of, according to Subsection 203-3.01, all excavated materials that remain after completing all backfill work and all excavated material not meeting the requirements of Selected Material, Type C, as defined in Subsection 703-2.07.

Dewater excavations immediately before and during embedding and backfilling operations. Backfill excavations with materials that meet the following requirements

a. Around formed foundations and the tops of pipe pile foundations, use material that meets the requirements of Selected Material, Type A,
b. Within the limits of the typical section, embed conduits and backfill trenches using material that meets the requirements of the lift in which it is located, reusing excavated materials if it meets the requirements of the applicable lift,
c. In all other locations, embed conduits and backfill trenches using material that meets the requirements of Selected Material, Type C, reusing excavated materials if it meets this requirement.
d. Import, when ordered, embedment and backfill materials that satisfy the preceding materials requirements.

Embed conduit(s) between two six inch lifts of material gleaned free of rocks exceeding a one-inch maximum dimension. Grade and compact the first lift to provide a surface that continuously contacts the assembled conduit run.

Within six feet of paved surfaces and around foundations, backfill in uniform layers no more than six-inches deep and compact each layer according to Subsection 203-3.04. In all other locations, compaction may be as approved by the Engineer.

4. Welding. Complete all welding according to subsection 504-3.01.8. Welding and approved shop drawings.

Submit shop drawings of the proposed work with the welding plans for approval. The shop drawings shall include material specifications, component dimensions, the types of welds that will be made, and the proposed type and extent of weld inspection.

Repair the holes, which were used to mount equipment, in reused poles and mast arms by welding in disks flush with the adjoining surface. For the disk material, use steel that matches the ASTM designation, grade, and thickness of the steel used to fabricate each pole. Cut disks that match the dimensions of the hole being repaired from pieces of steel plate bent to match the pole's radius at the hole. Grind the welds smooth and flush with the adjoining pole and disk surfaces. Repair the damaged finish according to subsection 660-3.01.8.

5. Removing and Replacing Improvements. Complete the following work at your expense.
   a. Reconstruct with new materials the nonreusable improvements you must remove to complete the work, the repairs of which are not covered by other items in the contract.
   b. Replace with new materials the reusable items that you damage, which are specified for reuse.
   c. Reconstruct with new materials all improvements you damage or remove, which do not conflict with the work and are not scheduled for removal.

Nonreusable improvements consist of cast in place items, including: asphalt concrete pavement, sidewalks, curb and gutter, lawns, and traffic markings. Reusable improvements include the items that were made before they were installed. You may not, however, reuse crushed aggregate base material as backfill in the base course if excavation depth exceeds the thickness of the base course.

Complete all reconstruction work, including materials, according to the applicable sections of the Alaska SSHC, and leave the work in a satisfactory and serviceable condition. In completing the reconstruction work, match the alignments, widths, thicknesses, shapes, sizes, cross sections, and finishes of the existing improvements.

If you remove a portion of sidewalk or curb and gutter, remove an entire segment between the weakened plane contraction joints or between an expansion joint and a weakened plane contraction joint.

Before removing a segment of Portland or asphalt cement concrete material, cut completely through the material with a saw along the outline of the area to be removed. Make cuts neat and true and prevent shatter outside the area removed.

To replace lawns, leave the top of the backfilled excavation low enough to install four inches of compacted topsoil. Match the top of the topsoil with the bottom of the vegetative mat. Apply seed and keep the seeded areas watered according to Section 618.

Remove, keep alive, and replant trees, shrubs, and plants according to Section 621. Replace the trees, shrubs, and plants that do not survive with plants of like size and type.

6. Salvaging or Reusing Electrical Equipment. When the Plans include existing electrical systems, save the controller assemblies, signal heads, mounting brackets, luminaires, lighting standards, signal posts and poles, mast arms, optical detectors, service equipment, light emitting diode optical units, and junction box lids and all other materials scheduled for reuse.

A controller assembly includes the cabinet and all equipment contained in the cabinet before Contract award, including bus interface units, controller unit, phase selectors, load switches, flasher unit, detector amplifiers, and conflict monitor unit.

Within 15 days of the Notice to Proceed, complete an inventory of the materials that will be saved in the presence of the Engineer. Note the location and condition of the materials. When you find material specified for reuse in an unserviceable condition, the Engineer will determine whether to repair it or replace it with new material, which will be paid for as extra work under subsection 109-1.05. Retain a copy of the inventory and give the original documents to the Engineer.

Remove, store, and deliver all saved equipment not scheduled to remain in service without damaging it. Replace at your expense all saved equipment damaged or destroyed before or during delivery or installation. Deliver all removed equipment not scheduled for reuse to the nearest District Maintenance Station or place specified. Notify the district superintendent or person(s) specified one-week before your planned delivery date.

Remove all unsaved materials from the highway right-of-way, including conduits, junction boxes, conductors, and foundations. Raze the tops of foundations abandoned in place according to subsection 660-3.02. Fill the holes left by removing junction boxes and foundations with selected material type A and compact them as directed.

With approval, after removing all conductors, you may abandon buried conduits that do not interfere with other construction with a credit taken by the Department. Remove the ends of all abandoned conduits from the junction boxes that will remain in service.

When you reuse the existing and State furnished equipment specified, complete the following work at your expense:

a. For relocated poles, install new foundations of the type specified and furnish new nuts, bolts, washers, and conduits needed to complete the installations.
b. For reused electroliers, including those electroliers that will remain on their foundations, install new illumination tap wires and fused disconnect kits.
c. Clean reused signal heads and luminaires inside and out.
d. Install new lamps in luminaires and new light emitting diode optical units in the signal heads.
e. For relocated signal heads, furnish and install the mounting brackets needed to complete the installations.
f. For reused poles, repair the holes that were made to mount equipment according to subsection 660-3.01.4. Welding.

g. For equipment with damaged finishes, including welded hole repairs, provide a new finish on the equipment according to subsection 660-3.01.8.

h. Adjust reused junction boxes and the conduit ends in them to the new grade according to subsections 660-3.04 and 660-3.03, respectively.

If you decide to use new equipment rather than reusing the equipment specified, notify the Engineer of the change and include a submittal per subsection 660-2.01.1.

Coordinate with Bill Sosnowski at 343-8355 (signal items) or Phil Saunders at 343-4557 (street lighting items) to arrange for MOA personnel to evaluate materials for salvage. Deliver the undamaged items for salvage to the MOA Pole Yard at 3rd & Orca St. or the MOA Signal Warehouse at 5923 Rowen St., as directed. Notify MOA personnel one week before planned delivery date of salvaged materials. Poles not selected for salvage shall have their plates cut off.

7. Field Tests. All electrical circuits must pass the following tests before the Engineer will accept the work for payment. Perform these tests in the presence of the Engineer, and document the results of each test on a per circuit basis. Retain a copy of all test results and give the original documents to the Engineer. Furnish all equipment needed to perform these tests.

Replace or repair at your expense, and in an approved manner, faulty materials and work revealed by these tests. After making repairs, repeat all tests on the repaired circuit and continue this process until all circuits have passed all required tests. The Department reserves the right to have you to retest circuits, and to use the retest results to accept or reject individual circuits.

a. Grounds. Before completing the circuitry and functional tests, physically examine conduits ends, junction box lids, load centers, and the foundations for signal posts and poles, lighting poles, and controller cabinets to ensure the grounding system required by subsections 660-3.06 and 661-3.01 has been installed and all splices and connections are mechanically firm.

b. Continuity. Test each loop detector circuit for continuity at the roadside junction box before splicing the loop detector to the lead-in cable. Each loop detector must have a resistance less than 0.5 ohms.

After splicing the loop detectors to the lead-in cables, test each pair at the controller or detector cabinet. Each pair must have a value less than 5 ohms for single pair lead-in cables and 10 ohms for multi-pair lead-in cables. The continuity test ohm reading at the cabinet must be greater than the ohm reading measured for the loop detector at the junction box.

c. Insulation Resistance Test. Perform a conductor insulation (megohm) test on all conductors. Complete the test between each conductor and ground and between the

conductors in a cable. Disconnect lamps and magnetometer sensing probes before completing the megohm test.

After splicing the loops to the lead-in cables, measure each pair in the lead-in cables at the controller or detector cabinet between one conductor and the cabinet ground rod. Insulation shall measure a minimum resistance of 100 megohms or the minimum specified by the manufacturer, measured at 500 volts DC.

d. Inductance Test. Measure each detector loop and lead-in cable system at the controller or detector cabinet. The inductance must be in the range of 50 to 500 microhenries.

e. Circuit. Energize every signal indication circuit with lamps installed before installing the load switches.

f. Functional. Perform the following tests on each signal and lighting system after the component circuits have satisfactorily passed the tests for continuity, grounding, insulation integrity, and circuitry.

1) For each new traffic signal system, complete at least 24 hours of flashing operation, followed by not less than 5 days of continuous, satisfactory operation. The Engineer may decide to omit the flashing portion of the test for modified signal systems and for new signals that replaced existing signals that remained in operation during the construction phase.

If the Engineer omits flashing operation and the system performs unsatisfactorily, correct the condition and repeat the test until the system runs for five days with continuous, satisfactory operation.

Begin the signal functional tests between 9:00 a.m. and 2:00 p.m. on any day, except a Friday, Saturday, Sunday, a legal holiday, or the day before the legal holiday.

Before each system turn-on, aim signal faces according to subsection 660-3.08 and ensure all equipment specified in the Plans is installed and operable, including: pedestrian signals and push buttons; signal backplates and visors; vehicle detectors; highway lighting; and regulatory, warning, and guide signs.

2) Perform the following functional test for each highway lighting system allow the systems be on continuously 5 days without the photocell, followed by a 5-day operational test using the photocell.

A shut down of the electrical system due to a power interruption does not constitute discontinuity of the functional test if the system functions normally when power is returned.

8. Repairing Damaged Finishes. Examine new, reused, and State-furnished equipment for damage to its finish before you put the equipment into service. Repair the damaged finishes found according to the following:

a. Galvanized. Repair damaged areas more than 12-inches away from welds and slip fit areas, by applying a minimum 7.8 mils of zinc-based alloy applied according to ASTM A780.

If the damaged areas are within 12-inches of welds and slip fit areas, make the repair by applying a minimum 7.8 mils of zinc-rich paint applied according to ASTM A780.

b. Painted. Repair damage to painted finishes according to the following

(1) Wash the equipment with a stiff bristle brush using a solution containing two tablespoons of heavy-duty detergent powder per gallon of water. After rinsing, wire brush surfaces to remove poorly bonded paint, rust, scale, corrosion, grease, or dirt. Remove dust or residue remaining after wire brushing before priming.

(2) Factory or shop cleaning methods may be used for metals if equal to the methods specified herein.

(3) Immediately after cleaning, coat bare metal with pre-treatment, vinyl wash primer, followed by 2 prime coats of zinc chromate primer for metal.

(4) Give signal equipment, excluding standards, a spot-finishing coat on newly primed areas, followed by 1 finishing coat over the entire surface.

(5) Give non-galvanized standards 2 spot-finish coats on newly primed areas.

Paint coats may be applied either by hand brushing or by approved spraying machines. Perform the work in a neat and workmanlike manner. The Engineer reserves the right to require the use of brushes for the application of paint, should the work done by the paint spraying machine prove unacceptable.

9. Regulations and Code. Complete all work according to the standards of the NEC, the NESC, and local safety codes as adopted and amended by the authority having jurisdiction.

660-3.02 FOUNDATIONS.

1. Cast-in-Place Foundations. Cast foundations for posts and poles in holes drilled at each pole's location shown in the Plans. Use precast or cast-in-place foundations for cabinets. Locate the tops of all traffic signal post and pole foundations flush with the adjacent finished: walkway, shoulder, or surrounding ground.

   a. Form the entire controller foundation and the top 12-inches of pole or post foundations and give the top a smooth steel trowel finish.

   b. Place conduits in the center of the pole-post foundations with clearance allowed for bushings. If subsurface conditions prevent completing a drilled hole, and when approved, use a corrugated metal pipe (CMP) form as a substitute for the drilled hole. Consider the savings in concrete to offset the cost of supplying and installing the CMP form. No additional payment will be made for the CMP formed foundation.

   c. When a CMP is used, over-excavate the area around the form enough to allow for proper compaction around the form. Perform backfill operations according to Section 204. Do not use water for drilling operations or other purposes where it may enter the hole.

   d. Use controller cabinet anchor bolts as recommended by cabinet manufacturer and set with a template.

   e. Place Class A concrete meeting Section 501. Place reinforcing steel meeting Section 503. If required, use corrugated steel pipe that is at least 14 gage, meeting subsection 707-2.01.

   f. Drill holes or use forms that are vertical and true to the locations shown in the Plans. Before placing the form or reinforcing steel cage, remove loose material to ensure the foundation rests on firm, undisturbed ground.

   g. If a reinforcing steel cage is required, place and secure it symmetrically about the vertical axis and securely block it to clear the sides of the foundation. Use a template to securely support anchor bolt assemblies and conduit ends so they do not move during concrete placement.

   h. Do not permit surface water to enter the hole. Before placing concrete, remove water that may have infiltrated in the hole. Thoroughly moisten both the forms and the ground before placing concrete. Pour each foundation in one continuous pour.

i. Do not erect or place posts, poles, and pedestals on the foundation until 7 days after placing the concrete. Plumb the assembly by adjusting the nuts on the anchor bolts before attaching the galvanized skirt.

j. Replace, with no additional compensation, finished foundations with anchor bolts that do not match the base plate of the pole or are out of plumb. Do not modify the anchor bolts or base plate to get the base plate set on the leveling nuts.

k. Install the bottoms of the bottom leveling nuts in a level plane within one-inch of the top of foundations. Generously lubricate the bearing surface and internal threads of top nuts with beeswax and tighten the top nuts according to the anchor bolt tightening procedure included in the contract documents.

l. Attach a 4 AWG, bare, solid copper wire as a grounding electrode conductor to the #4 spiral bar in the reinforcing steel cage. Use an irreversible compression connector or cadweld to make the attachment. Protect the attachment during concrete placement. In foundations that lack reinforcing steel cages, install 21 feet of coiled 4 AWG, bare, solid copper wire as the grounding electrode. Route the conductor to protrude near the top, center of the foundations. Slide a minimum six-inch long, non-metallic, protective sleeve over the conductor. Allow one-inch of the sleeve and 24-inches of conductor to protrude from the foundations.

2. Pile Foundations.

a. Install pipe piles according to Section 505.
b. Install pipe piles open-ended and to a minimum depth of 15 feet (less top projection).
c. Use CJP groove welds for circumferential welds.
d. Inspect 100% of CJP welds using UT or RT.
e. Backfill and compact the work hole around upper portion of each pile in 8-inch lifts with a soil-cement mixture that consist of a minimum of 3 sacks of cement per cubic yard of soil.
f. Certify steel pipe piles by matching the stencils on the pipe piles (by 300 feet lots) to the physical and chemical tests for the applicable lot.
g. Use no more than one splice per foundation. Locate the splice at least seven feet from the top of pile.

3. All Foundations.

a. Install frangible couplings according to the manufacturers written installation instructions. Use shims furnished by the coupling manufacturer.

b. Provide new foundations and anchor bolts of the proper type and size for standards that are to be relocated. Install the anchor bolts on a bolt circle that matches the base plate.

c. Install a raised Type III junction box on the door side of the controller cabinet, and butt it against the cabinet's foundation unless installing a one-piece cabinet/junction box foundation. Extend the top of the controller cabinet foundation 18-inches above the junction box and provide it with a one-inch diameter drain. The drain connected to the cabinet interior must empty to the rear and above the ground. Place conduits in the door side half of the foundation to provide adequate terminal block clearance.

d. Existing foundations may be abandoned-in-place. However, remove the tops of the foundations, reinforcing steel, anchor bolts, and conduits to at least 12-inches below the roadway subgrade, sidewalk, or unimproved ground. Backfill the resulting hole with material equivalent to and compacted to the density of the surrounding ground.

660-3.03 CONDUIT. All electrical conductors shall be installed in conduit, except for overhead wiring, wiring inside poles, and when otherwise specified. Use rigid metal conduits (RMC) and fittings for raceways, including bored casings. Install conduits of the sizes specified along the routes detailed on the Plans. When routing is not shown, route conduits as directed by the Engineer.

1. Install conduits at least 30-inches below the finished grade of the ground above the conduit, except conduits that will be sealed under a minimum 4-inch thick Portland cement concrete sidewalk may be installed a minimum of 18-inches below the top back of curb or surface above the conduit, whichever is lower.

2. Install conduits that cross unpaved-areas and paved roadways that will be overlaid in excavated trenches. Excavate, bed conduits, and backfill trenches according to subsection 660-3.01.3, Excavating and Backfilling.

3. Install conduit(s) under paved roadways and approaches that will not be overlaid by jacking them under pavements up to 30 feet wide and by boring or drilling methods under pavements greater than 30 feet wide.

4. Sweep conduits, except loop detector tails, through the open bottom of junction boxes by installing 90-degree elbows on the ends of conduit runs. To each elbow, install a nipple that terminates 5 to 12-inches above the bottom edge of each junction box.

5. Install the tails of loop detectors without elbows through the walls of junction boxes at elevations that ensure the loops drain into the box. Extend the ends a minimum of 2-inches beyond the inside wall of the box.

6. Drill a 3/8-inch drain hole in the bottom of the lower straight section of all elbows and in the bottom of conduits at the low points of all conduit runs. Smooth the edges of the

drilled holes on the inside of elbows to prevent scraping the conductors. Cover the holes with a wrap of approved filter cloth secured with two self-clinching nylon cable ties.

7. Keep conduits clean at all times. Install grounding bushings and approved plastic insert type plugs on the ends of all conduit runs before backfilling around the conduit ends.

8. At the low points of conduit runs, install sumps containing a minimum 2 cubic-feet of coarse concrete aggregate material. Compact the aggregate sumps as directed to prevent settlement of the trench backfill.

9. Install conduits that must cross existing facilities such as storm-drain pipes, duct systems, and other underground utilities at the minimum depths specified, going under the facilities if necessary. Install additional drains and aggregate sumps at the low spots, if any.

10. Position conduits in trenches, junction boxes, and foundations to provide clearances of at least 2½ -inches around two-inch conduits and at least 2-inches around conduits larger than 2-inches.

11. Fabricate conduits less than 10 feet long from standard lengths of conduit. Cut conduits squarely to ensure the threading die starts squarely on the conduit. Cut the same number of threads as found on the factory threaded ends. Ream the inside of all conduit ends cut in the shop or field to remove burrs and sharp edges. Do not use slip joints or pieces of running thread pipe.

12. Coat drilled holes, shop and field cut threads, and the areas with damaged zinc coating with zinc rich paint.

13. When standard couplings cannot be used to join conduit components, use approved threaded unions.

14. Bury a continuous strip of 4 mils thick, six-inch wide polyethylene marker tape above all underground conduit runs. Install the tape 9-inches (± 3 inches) below finished grade, using two strips side-by-side to mark road crossings. Furnish tapes with a black legend on a red background.

15. If you encounter obstructions during jacking or drilling operations, obtain approval and cut small holes in the pavement to clear the obstruction. Locate the bottom inside face of the bore pit no closer than the catch point of a 1-¼ to 1 slope (a horizontal to vertical ratio) from the edge of pavement. Do not leave these pits unattended until you have installed an approved means of protection.

16. In foundations, install 90-degree elbows and conduits of the size and quantity shown on the Plans. Extend the conduits a maximum of 2-inches above the top of the foundations for posts and poles with breakaway bases and 4-inches above the top of foundations for fixed base structures.

irreversible compression connector. Insulate the splice with heat shrink tubing. Complete the splice in the space between the top of the load center foundation and the bottom of the cabinet. Limit the length of the #8 AWG conductor to five-feet.

660-3.06 BONDING AND GROUNDING. Bond and ground branch circuits according to the NEC and the following requirements. Make non-current carrying but electrically conductive components, including: metal conduits, junction box lids, cabinets, transformer cases, and metal posts and poles, mechanically and electrically secure to an equipment grounding conductor. Make fixtures mounted on metal poles, including signal components and luminaires, mechanically and electrically secure to the pole.

Install grounding bushings with insulated throats on the ends of all metallic conduits. Use malleable iron or steel bushings with a mechanically galvanized or zinc plated finish and a locking stainless steel or brass mounting screw. Grounding lugs shall either be an integral part of the bushing or consist of an attached tin-plated copper saddle. All grounding lugs shall feature a stainless steel screw, the centerline of which falls within 20 degrees of conduit centerline.

Install a bare stranded copper wire for the equipment grounding conductor in conduits, except those conduits installed for future use. Install size 8 AWG conductors, except in those conduits that contain circuit conductors larger than 8 AWG. In this case, install a wire equal in size to the largest circuit conductor. Attach the grounding conductors to the grounding bushings, leaving 12-inches of slack between each bushing. Connect grounding conductors together using irreversible compression type connectors to form a fully interconnected and continuous grounding system.

Retrofit existing spare conduits that will contain new cables exclusively with new grounding bushings. When the Plans require installing or removing conductors from existing conduits, retrofit them with new grounding conductors sized according to the preceding paragraph.

Bond junction box lids to the grounding conductor using copper braid with a cross-sectional area equal to an 8 AWG conductor. Connect bonding jumpers to the grounding conductors using irreversible compression type connectors. Replace missing or damaged conduit and junction box lid bonding jumpers.

Join the equipment grounding conductors from the conduits to the 4 AWG grounding electrode conductor using irreversible compression connectors at Portland cement concrete foundations. For pile foundations, attach the equipment grounding conductor from the conduit to the pile cap adapter with a listed mechanical grounding connector.

When installing signal poles, signal posts, and lighting standards with frangible coupling bases, run a four feet long grounding conductor from the grounding bushing on the conduit to the grounding lug located in the hand hole of each pole.

Bond slip-base type standards and pedestals by using 2 conductors from the conduit, one attached with a ground rod clamp to an anchor bolt and the other connected to the grounding lug located in the hand hole of each pole.

Ground one side of the secondary circuit of a transformer.

Install a ¾" by 10 feet copper clad ground rod inside each controller cabinet foundation and a 6 AWG bare stranded copper wire for the grounding electrode conductor.

660-3.07 NOT USED.

660-3.08 SIGNAL AND LIGHTING INSTALLATION REQUIREMENTS. Install signal and lighting equipment according to the details shown on the Plans and the following:

Determine the shaft lengths and signal mast arm connector plate locations on poles to meet the plan mounting heights of luminaires and traffic signal heads.

Remove burrs and sharp edges from the inside and outside of holes before passing conductors through the walls of posts, poles, mast arms, signal heads, and other equipment.

Furnish all work to install foundations for relocated poles, including: conduit, excavation, reinforcing steel, class A concrete, anchor bolts, nuts, and washers.

Orient photoelectric control units mounted on top of poles to face the north sky.

To install photoelectric controls on top of electroliers, use a pole top adapter manufactured to fit over the end of poles, General Electric model PTA-PECTL or approved equal.

To install photoelectric controls on signal poles, wood poles and on Type 1 and 1A Load Centers, use a receptacle manufactured to fit the end of a rigid metal conduit, General Electric model MB-PECTL or approved equal. On signal poles, attach a short nipple to the rain cap using a Myers hub sealed with silicone.

Electrolier Installation. Before installing electroliers, check the socket position of each luminaire to verify it matches the position indicated in the instructions for the light distribution type shown on the Plans.

Install electroliers with mast arms with a slight rake by plumbing the side of the pole opposite the mast arm. After the pole has been plumbed, level the luminaire as recommended by the manufacturer.

Install electroliers without mast arms with the centerline of the pole plumb.

660-3.09 MAINTAINING TEMPORARY AND EXISTING ELECTRICAL SYSTEMS. This work consists of protecting and maintaining the existing and temporary electrical systems during the life of the contract. The work includes: locating, repairing, replacing, adjusting, realigning, cleaning, and relocating components of traffic signals, lighting systems, and flashing beacons to keep them wholly operational and positioned according to the following specifications.

If you fail to maintain the electrical system as specified herein, the Engineer will reduce the payments to you under Item 660(22), Illumination Price Adjustment.

Furnish the Engineer with the name and phone number of the person who will maintain the existing and temporary electrical facilities at the Preconstruction Conference. Make this person available at times until the date of Acceptance for Traffic and Maintenance and provide labor, materials, and equipment this person may need to complete repairs ordered by the Engineer.

When beginning work, the Engineer will notify the Contractor and the local maintenance agencies in writing of the transfer of maintenance responsibilities, providing an effective date and time. Maintenance does not include replacing defective equipment or repairing damage before transferring maintenance responsibility. Therefore, before starting work on the project, inventory the condition of the existing equipment and document damaged and defective equipment, the Engineer will inspect with the Contractor. If beginning work before providing the Engineer with an inventory, the Contractor will waive the right to claim extra compensation when the Engineer later finds damaged or defective equipment.

Keep components of the existing and temporary electrical systems operational during the progress of the work, except when the Engineer allows shutdowns to alter or remove the systems. The Engineer will consider these systems operational when no damaged or defective equipment is found in service, components are clean, located, and aligned as specified herein, and photoelectric controls operate the lighting systems. The State will pay for electricity used to operate the systems, if the public benefits from their operation. Furnish replacement equipment compatible with equipment used in the Central Region.

Begin work to repair, replace, adjust, realign, clean, and/or relocate components of an affected system within one hour when ordered by the Engineer. If work is not complete, the Engineer may have outside forces complete the repairs and deduct the amount billed from monies due the Contractor.

When working on a traffic signal system, print a record of work performed in the diary found in each controller cabinet. Make sure each entry includes

1. The dates and times beginning and completing work, and the names of the crewmembers completing the work.

2. The characteristics of the equipment failure or faulty operation evident before repair.

3. The changes made or corrective actions taken.

4. The printed name and signature of the person responsible for making the repairs or changes.

The Engineer will limit signal system shutdowns to the hours traffic restrictions are allowed in subsection 643-3.08, Construction Sequencing. During shutdowns, use flag persons to control traffic. Provide local traffic enforcement and maintenance agencies 24-hour notice before shutting down a traffic signal system.

Locate existing conduit runs, buried cables, junction boxes, and underground utilities before starting work that may damage these facilities or interfere with these systems.

Where roadways remain open to traffic and the work includes modifying the existing lighting systems, energize the modified circuit by sunset on the same day the Contractor retires the original circuit.

Relocate or replace signal poles, lighting standards, sign poles, flashing beacon poles, load centers, and controller cabinets whenever reducing clearance from the traveled way to less than six feet.

During the various phases of construction, shift the signal heads to keep them aligned horizontally and vertically with the approaches according to the following:

1. For overhead signals located 53 feet and more from the stop line, maintain 17.5 feet to 21.5 feet of clearance between the traveled way and the bottom of each signal. For closer signals refer to the MUTCD for maximum clearances.

2. For side mounted signals, maintain nine feet to 11 feet of clearance between the traveled way and the bottom of the signal.

3. Align overhead signals controlling a single lane with the center of the lane.

4. Align overhead signals controlling two or more lanes with the lane lines separating the lanes.

5. When the horizontal angle to the side mounted far right signal exceeds 20°, relocate this signal to an overhead location. Measure the angle 10 feet back from the stop line on the lane line between the two farthest left through lanes.

    i. With two or more through lanes, center one signal head over each lane.

    ii. With one through lane and protected-permitted signal phasing, leave the five section signal over the lane line and center the signal to be relocated over the through lane.

iii. Otherwise, install the relocated signal eight feet to the right of the signal centered over the through lane.

6. For pedestrian signals, maintain seven to nine feet between the traveled way and the bottom of each pedestrian signal.

7. Aim signal heads according to Table 660-2 found in subsection 660-3.08, Signal and Lighting Structures.

When no longer required, salvage original and Department provided equipment according to the Plans and item 6. Salvaging or Reusing Electrical Equipment found in subsection 660-3.01, and remove other materials used in the temporary systems from the project.

660-4.01 METHOD OF MEASUREMENT. Section 109 and the following:

Item 660(11), Traffic Loop. By each loop unit, complete and in place, including conduit, conductors, and other equipment to the nearest junction box. All work associated with installing loop detectors is subsidiary to Item 660(11). This includes, but is not limited to, saw cutting, asphalt removal, aggregate base course, tack coating and installing new asphalt and concrete.

Item 660(22), Illumination Price Adjustment. By the mile for each roadway with all or part of its illumination system inoperative. A divided roadway is considered one roadway. Ramps are considered a separate roadway. The Engineer will measure each unlit section less than one mile long as one mile.

660-5.01 BASIS OF PAYMENT. Sign removal and reinstallation required to install foundations, conduits, and junction boxes is subsidiary. Minor conduit routing changes as directed are subsidiary to existing contract pay items. Concrete required to complete the foundations is subsidiary. If no item for Bored Casing is included in the bid schedule, boring is subsidiary to other items of work.

The amount bid for an item shall include full compensation for all excavation, bedding, and backfill required to install the components shown in the Plans. Dewatering excavations is a subsidiary obligation of completing the excavation work.

The Engineer will pay for the disposal of all surplus and unusable excavation and for all imported backfill and bedding material at their respective contract unit prices, or as extra work if the contract does not include these items.

Include in your bid the costs of repairing the improvements you must remove or damage to complete the work, the repairs of which are not covered by other items in the contract.

The costs of repairing damage to finishes on new equipment are a subsidiary obligation.

All work associated with installing loop detectors is subsidiary including: saw cutting, asphalt removal, aggregate base course, tack coating, and installing new asphalt concrete.

Payment for Item 660(15), Decorative Lighting, will include full compensation for all work involved in completing all excavation and materials to install electroliers, foundations, conduits, and junction boxes, backfilling and compacting trenches, removing and replacing improvements, installing sumps under junction boxes, and pulling conductors.

Payment for Item 660(17A), Traffic Signal System Modifications Complete (Bragaw/Debarr, will include full compensation for all work involved in completing all excavation and materials to install conduits, and junction boxes, backfilling and compacting trenches, removing and replacing improvements, installing sumps under junction boxes, and pulling conductors.

Payment for Item 660(17B), Traffic Signal System Modifications Complete (Bragaw/Penland), will include full compensation for all work involved in completing all excavation and materials to install conduits, and junction boxes, backfilling and compacting trenches, removing and replacing improvements, installing sumps under junction boxes, and pulling conductors.

The Engineer will pay Item 660(26), Signal System Timing and Adjustments, based on paid receipts plus 15 percent for authorized work performed by the Municipality of Anchorage. A directive will not be required to initiate payment for work performed under Item 660(26). Pay all costs of the Municipality re-testing equipment that fails to comply with the Plans and Specifications.

For each mile of roadway with existing lighting systems that the Contractor fails to keep fully operational, the Engineer will deduct $1,275.00 per day from the payments due the Contractor. (06/26/03)R65USC02

Payment will be made under:

Pay Item	Pay Unit
660(3) Highway Lighting System Complete	Lump Sum
660(11) Traffic Loop	Each
660(15) Decorative Lighting	Lump Sum
660(17A) Traffic Signal System Modifications Complete (Bragaw/Debarr)	Lump Sum
660(17B) Traffic Signal System Modifications Complete (Bragaw/Penland)	Lump Sum
660(22) Illumination Price Adjustment	Contingent Sum
660(26) Signal System Timing and Adjustments	Contingent Sum

SECTION 661

ELECTRICAL LOAD CENTERS

Special Provisions

Add the following subsection:

661-1.03 EQUIPMENT LIST (S) AND DRAWINGS. Within 30 days following award of the contract, submit 4 collated copies of a portfolio of equipment and material to be installed. The Department will review these for approval. The portfolio(s) shall consist of a table of contents which includes each item's intended use(s) and the following:

1. For materials on the Approved Products List: a description that includes product name, manufacturer, model or part number, and the conditions listed for approval.

2. For materials not on the Approved Products List: catalog cuts that include the manufacturer's name, type of product, size, model number, conformance specifications, and supplemented by other data as may be required, including manufacturer's maintenance and operations manuals, or sample articles.

This information may be included in the portfolio for 660 items.

The Department will not be liable for any material purchased, labor performed, equipment used, or delay to the work before all equipment and materials have been reviewed and approved.

661-2.01 MATERIALS. *Add the following to the paragraph titled "Meters"*: Furnish meter sockets and landing pads rated for 200 ampere services.

661-5.01 BASIS OF PAYMENT. *Add the following*: Payment of any fees required by the local authority for an electrical inspection and the costs of correcting the deficiencies noted during the inspection shall be considered incidental to the Section 661 items

Add the following Section: **SECTION 662**

SIGNAL INTERCONNECT

Special Provisions

662-1.01 DESCRIPTION. This item consists of all work required to furnish and install signal interconnect in conduit between the controller assemblies shown on the plans along the route indicated, or on a route as directed by the Engineer.

662-1.02 REGULATIONS AND CODE. Complete all work in accordance with these specifications and Section 660, Signals and Lighting.

662-2.01 MATERIALS. Submit all materials for review and approval per the requirements of Item 1. Equipment List and Drawings of Subsection 660-2.01 MATERIALS.

Furnish a 25 pair #19 telephone cable conforming to REA Specification PE-39 for the interconnect cable. Install the interconnect cable in a 2" galvanized rigid metal conduit.

Encapsulate completed splices in waterproof reenterable type splice kits of the same type used for loop lead-in cable splices. REA Bulletin 344-2 entitled "Lists of Materials Acceptable for use on Telephone Systems of REA Borrowers" provides a list of acceptable splice materials.

662-2.02 GALVANIZED RIGID METAL DUCT SYSTEM. Install a galvanized rigid metal duct system in which to pull the interconnect cable.

Furnish UL standard UL-6 galvanized conduit that is of the rigid metal type and manufactured of mild steel or wrought iron.

Furnish fittings used in the duct system such as elbows, etc. made from the same material as the duct.

Keep all junction boxes and ends of conduit covered unless you are pulling conductors.

Mark all underground conduits with a continuous strip of polyethylene marker taped. Furnish marker tape with a black legend on a red background that 4 mil thick and 6" wide. Install the tape 6" below finished grade.

Use care in all compaction operations to prevent damage to the junction boxes and conduits. Remove and replace all items damaged during the backfill and compaction operations at no additional cost to the State.

After testing and installing the conductors, plug all conduit openings with duct seal to prevent water from entering the duct system.

662-2.03 JUNCTION BOX. Furnish pre-cast, reinforced concrete junction boxes conforming to the sizes and details shown on the Plans. Install junction box lids made of cast iron.

662-3.01 CONSTRUCTION REQUIREMENTS. The signal interconnect consists of cable, conduit, junction boxes, other necessary hardware required to complete the item, cable splicing, and the termination of conductors on terminal blocks.

Install the galvanized rigid metal duct at least 30" below finished grade.

Install Type II junction boxes at all abrupt changes in conduit alignment and on 400' maximum centers. Angle points and curves with delta angles greater than 45 degrees constitute an abrupt change. Complete all interconnect cable splices in Type II or III junction boxes. Complete all splices in accordance with Rural Electrification Administration (REA) Specification PC-2 for splicing telephone cables. The Engineer, must approve any splice locations beforehand.

662-3.02 EXCAVATING AND BACKFILLING. Backfill the excavations according to Section 204.

662-4.01 METHOD OF MEASUREMENT. Section 109

662-5.01 BASIS OF PAYMENT. The contract unit price paid for signal interconnect constitutes full compensation for furnishing all work required to complete the work specified. Terminal blocks for the interconnect cable shall be subsidiary to Item 662(1) Signal Interconnect.

Payment will be made under:

Pay Item	Pay Unit
662(1) Signal Interconnect	Lump Sum

SECTION 670

TRAFFIC MARKINGS

Special Provision

670-1.01 DESCRIPTION. *Delete this subsection in its entirety and substitute the following:*
This work consist of furnishing, preparing and placing pavement markings at the locations shown on the Plans or as directed. Meet these Specifications and the applicable portions of the Alaska Traffic Manual.

670-3.01 CONSTRUCTION REQUIREMENTS. *Delete all paragraphs under item 4. Methyl Methacrylate Pavement Markings. and substitute the following:*

a. General. Ten 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 a copy 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 methyl methacrylate 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 methyl methacrylate 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. Application. Apply methyl methacrylate marking material according to these Specifications and the manufacturer's recommendations. Use equipment designed and capable of properly mixing at the point and time of application and approved by the manufacturer for the type of product being installed.

For longitudinal markings, legends, symbols and transverse markings use manual or automatic application equipment. Use mechanical bead dispensers to uniformly apply the top coat of beads. Stencils or extruders are required to form sharply defined markings

(1) Longitudinal Markings Surface Applied. Apply markings for lane lines, edge lines, and centerlines to yield a thickness of 60 mils as measured from the surface of the pavement. Use Type C material, as specified in subsection 712-2.17.

(2) Transverse Markings Surface Applied. Apply markings for onlys, arrows, stop bars, gore stripes, railroad symbols and cross walks to yield a thickness of 125 mils as measured from the surface of the pavement. Use Type C material, as specified in subsection 712-2.17.

f. Disposal of Waste. Waste material becomes the Contractor's property. This includes grindings and removed marking material. Do not dispose of or store stripe removal wastes material or asphalt grindings on State property. Dispose of waste material according to applicable Federal, State, and local regulations.

g. Sampling. Record the following readings, and the locations where they were taken, and submit them to the Engineer within 24 hours for evaluation. Thickness of material is measured from the surface of the pavement.

For longitudinal applications, measure the thickness of the lines (above the pavement surface), at the time of application, every 300 feet.

For surface applied transverse 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.

Measure the retroreflecivity of each transverse marking at three locations, and of each line at intervals not to exceed 500 feet. Take these measurements using a Delta LTL2000 Retrometer, a 100 foot retro-reflectometer, or approved similar device. Perform testing within 72-hours of curing.

The Engineer may elect to use the Contractors readings or perform additional sampling.

670-3.04 PAVEMENT MARKING REMOVAL. *Replace the first sentence of the second paragraph with the following:* Remove pavement markings to the fullest extent possible by a method that does not materially damage the surface or texture of the pavement. Painting over existing striping does not meet the removal requirement. Do not use any method utilizing burning with an open flame for removing pavement markings on the final paving lift.

670-3.06 TOLERENCES FOR LINE STRIPING. *Delete this Subsection in its entirety and replace with the following:*

1. Length of Stripe. ± 2 inches.
2. Width of Stripe. ± 1/8 inches.
3. Lane Width. ± 4 inches from the width shown in 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 4 inches from the planed alignment.
7. Double Stripes. ± ¼ inches between stripes.
8. Thickness of surface applied. Minimum specified to a maximum of + 30 mils.

If it is determined that the material is being placed too thin, or otherwise not to specification, make immediate adjustments to correct the problem.

Methyl methacrylate pavement markings applied by any method will be unacceptable if:

1. The marking is not straight or wide enough.
2. The thickness of the line is not uniform or less than specified.
3. The top of the line is not smooth and uniform.
4. The material is uncured.
5. The material blackens or is inconsistent in color.
6. The edge of the markings are not clear-cut and free from overspray.
7. The reflective elements are not properly embedded.
8. The markings exhibit poor adhesion.
9. The retro-reflectivity of the markings is less than specified and not uniform.
10. The 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 300 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.

670-5.01 BASIS OF PAYMENT. *Add the following*: There will be no separate or additional payment for the following:

- 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.

Milling for installation of the inlaid markings is subsidiary to other items. Payment includes costs associated with this item, including the removal of millings.

Item 670(10) includes full compensation for resources required to perform the work according to the Plans and Specifications. No separate payment shall be made for over-runs of material caused by the variation of the gradation of the asphalt or for additional material required to achieve the thickness specified on open-graded pavement. (08/10/04)R246usco04

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SECTION 703

AGGREGATES

Special Provision

703-2.03 AGGREGATE FOR BASE.

Delete Table 703-2 and substitute the following:

TABLE 703-2

AGGREGATE FOR UNTREATED BASE
Percent Passing By Weight

Sieve Designation	Grading C-1	Grading D-1	Grading E-1
1 ½ inch	100		
1 inch	70-100	100	100
3/4 inch	60-90	70-100	70-100
3/8 inch	45-75	50-79	50-85
No. 4	30-60	35-58	35-65
No. 8	22-52	20-47	23-50
No. 30	10-33	10-26	13-31
No. 50	6-23	6-19	10-26
No. 200	0-6	0-6	8-15

(06/22/04)R117USC04

703-2.04 AGGREGATE FOR ASPHALT CONCRETE PAVEMENT.

Delete this section and substitute the following:

A minimum of three stockpiles of crushed aggregates is required.

Coarse Aggregate (retained on the No. 4 sieve.) Crushed stone or crushed gravel consisting of sound, tough, durable rock of uniform quality. For Type V and VH asphalt concrete mixtures, remove all natural fines passing a #4 sieve before crushing aggregates. Free from clay balls, organic matter, and other deleterious material. Not coated with dirt or other finely divided mineral matter. Type VH, Hard Aggregate mixes require that only the coarse aggregate component meet the specified Nordic Abrasion values. Meet the following requirements:

	I	Type IIA, IV	Type I, IIB, III	Type V	Type VH
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 %	WAQTC FOP for AASHTO TP61	90, 2-face	80, 1-face	**95**, 2-face	**95**, 2-face
Thin-Elongated Pieces, max % 5:1 3:1	ATM 306	 8 20	 8 -	 5 15	 5 15
Nordic Abrasion, max. %	ATM 312	12		12	8
Absorption, max. %	AASHTO T85	2.0		2.0	2.0

The engineer may modify the fracture requirements if the hard aggregate sources stated in 106-1.02 do not meet specifications.

Fine Aggregate (passing the #4 sieve). For Type IV, V, and VH mixes, remove all natural fines passing a #4 sieve before crushing aggregates for this asphalt concrete mixture. Consist entirely of aggregate produced from aggregate crushing process and be non-plastic as determined by WAQTC FOP for AASHTO T 90. Meet the quality requirements of AASHTO M 29, including S1.1, Sulfate Soundness and the following:

Property	Test Method	Requirement
Fine Aggregate Angularity	AASHTO T 304	45% min.

TABLE 703-3
BROAD BAND GRADATIONS
FOR ASPHALT CONCRETE PAVEMENT AGGREGATE
Percent Passing by Weight

SIEVE		GRADATION				
	mm	Type I	Type II	Type III	Type IV	Type V, VH
1 inch	25.0	100				100
¾ inch	19.0	80-90	100			90-100
½ inch	12.5	60-84	75-95	100	100	65-75
3/8 inch	9.5	48-78	60-84	80-90	80-95	48-60
No. 4	4.75	28-63	33-70	44-81	55-70	30-40
No. 8	2.36	14-55	19-56	26-70	35-50	20-30
No. 16	1.18	9-44	10-44	16-59	20-40	≤ 22
No. 30	0.600	6-34	7-34	9-49	15-30	≤ 17
No. 50	0.300	5-24	5-24	6-36	10-24	≤ 14
No. 100	0.150	4-16	4-16	4-22	5-15	≤ 12
No. 200	0.075	3-8	3-7	3-7	4-7	3-8

SECTION 707

METAL PIPE

Standard Modification

Delete subsection 707-2.07 and replace with the following:

707-2.07 GALVANIZED STEEL WATER CONDUIT. Meet the following:

Galvanized Pipe	ASTM A 53 or ASTM A 120, galvanized according to AASHTO 111
Galvanized Fittings	ASTM A 234 galvanized according to AASHTO M 232.

E17(6/30/04)

SECTION 710

FENCE AND GUARDRAIL

Special Provision

710-2.03 CHAIN LINK FABRIC. *Change Class D coating to Class C coating.* (9/13/04)R273usc04

SECTION 712

MISCELLANEOUS

Special Provision

712-2.06 FRAMES, GRATES, COVERS, AND LADDER RUNGS. *Add the following*:

Ductile iron castings	ASTM A536 for grade 60-401.

(02/22/00)R78M98

712-2.17 METHYL METHACRYLATE PAVEMENT MARKINGS. *Delete the first and second paragraphs under item 1. Quality Requirements: and substitute with the following:* 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".

Type A – Spray application: Material formulated for spray application without factory intermix beads or anti skid aggregate. Use glass beads and aggregate designed to be applied to freshly applied material to meet the specified retroreflectance and anti-skid properties, such as Dura-Stripe Plus Type V or approved equal.

Type B – Extruded application: Material formulated for extruded application with factory intermix beads and anti skid aggregate, and additional surface applied beads, such as Dura-Stripe Plus Type III or approved equal.

Type C – Spray or Extruded: Material formulated for spray or extruded application with factory intermix beads and anti skid aggregate and additional surface applied beads, such as Dura-Stripe Plus Types I, III or IV.

2. Performance Properties: *Add the following:*

   k. Adhesion: To Portland Cement, minimum 2000 psi, to asphalt, dependent on tensile failure of the substrate. (07/17/03)R246M98

   l. Color: Yellow, PR-1 chart, 33538 Federal Yellow. White, minimum daylight reflectance of 84.

712-2.18 GLASS BEADS FOR METHYL METHACRYLATE PAVEMENT MARKINGS. Delete the bead table and substitute the following: Use the type and amount of beads specified in writing by the marking material manufacturer necessary to meet the performance requirements. (08/10/04)R246usco04

SECTION 724

SEED

Special Provisions

724-2-02. MATERIALS. *Delete Table 724-1 and substitute the following:*

TABLE 724-1

SEED REQUIREMENTS

Species	Sproutable Seed*, %, Min.
Arctared Red Fescue	78
Egan American Sloughgrass	67
Norcoast Bering Hairgrass	71
Nortran Tufted Hairgrass	71
Wainwright Slender Wheatgrass	88
Alyeska Polargrass	71
Bluejoint	71
Tilesy Sagebrush	71
Tundra Glaucous Bluegrass	76
Gruening Alpine Bluegrass	72
Nugget Kentucky Bluegrass	76
Beach Wildrye	70
Annual Ryegrass	76
Perennial Ryegrass	76

* Sproutable Seed is the mathematical product of Germination and Purity.

(11/06/02)R52USC

* deleted text *

SECTION 726

TOPSOIL

Special Provision

726-2.01 TOPSOIL. Delete item 2. and substitute the following:

2. Topsoil shall contain not less than 5 percent and no greater than 15 percent organic matter by dry weight as determined by ASTM T-6.

Delete the gradation table in the third paragraph and substitute the following:

Sieve Size	Percent Passing (by Weight)
½ inch	100
No. 4	95-100
No. 16	64-90
No. 200	30-60
Organic Content	5%-15%

Delete first paragraph after the table under item 3. and substitute the following: Notify the Engineer of the source of topsoil at least 30 calendar days prior to delivery of topsoil to the project from the location. Submit a soil analysis for particle size, nutrient content and organic content to the Engineer, 10 working days prior to final placement or before any topsoil is accepted for this project. The Engineer may test the topsoil at any time to verify compliance with the topsoil analysis. If the supplied topsoil does not meet specifications in this section, the Contractor shall supply new topsoil of a quality required to meet the section standards.

Below the last paragraph, delete the fertilizer constituents criteria and substitute the following:

Nitrogen	50 – 75 PPM
Phosphoric Acid	112 – 165 PPM
Potassium	121 – 200 PPM

(2/18/03)R&M

SECTION 727

SOIL STABILIZATION MATERIAL

Special Provisions

727-2.01 MULCH. *Delete numbered item 1. in its entirety and substitute the following:*

1. Virgin/Recycled Wood Fiber, Recycled Paper ("wood cellulose") Mulch, or a Blend of Virgin/Recycled Wood Fiber with Recycled Paper Mulch. Blended mulch may contain up to 50 percent recycled paper. The mulch shall meet the following requirements:

   a. Contains no growth or germination inhibiting factors.

   b. Will remain in uniform suspension in water under agitation and will blend with grass seed, fertilizer, and other additives to form homogeneous slurry.

   c. Mulch can be applied uniformly on the soil surface.

   d. Will not create a hard crust upon drying and have moisture absorption and retention properties and the ability to hold grass seed in contact with the soil.

   e. Dyed a suitable color to facilitate inspection of its placement.

   Ship the mulch material in packages of uniform weight (plus or minus 5 percent) and bear the name of the manufacturer and the air-dry weight content.

   Use a commercial tackifier on all areas steeper than 3:1. Use the amount recommended by the manufacturer.

(08/19/99)R206M98

SECTION 730

SIGN MATERIAL

Special Provisions

730-2.04 SIGN POSTS. *Add the following item*:

7. Structural Tubing and W-Shape Beams.

a. Structural tubing shall conform to either 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. (06/22/04)R81USC04

Delete this Section in its entirety and substitute the following:

SECTION 740

SIGNALS AND LIGHTING MATERIALS

740-2.01 GENERAL. Use electrical materials, devices, fittings, and hardware that conform to applicable NEMA and ANSI standards.

Use electrical products that are Third Party Labeled or Listed (by an approved independent electrical testing laboratory such as UL, ETL, CSA, etc.), unless otherwise indicated on the Materials Certification List (MCL).

Ensure that all material and workmanship, as determined by the Department, conform to the standards of the NEC, the NESC, and local safety codes as adopted and amended by the authority having jurisdiction.

740-2.02 SIGNAL AND LIGHTING POLES. Design and fabricate highway lighting and traffic signal structures with pole shaft lengths to 55 feet long to conform to the 1994 Edition of AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals* with interim revisions.

A registered professional engineer shall design the structures and provide stamped shop drawings and calculations. Submit the stamped drawings and calculations for each pole to the Engineer for approval. Design for stresses on the completed structure with hardware in place.

1. In the stamped calculations, indicate the edition of Standard Specifications to which the poles are being designed and provide the input data used to design each pole and mast arm, including: design wind speed, cross section shape, yield strengths of the component materials, dimensions of the pole components, and a summary of the loads used.

2. On the stamped shop drawings, provide design wind speed and the details for building the poles and mast arms, including: materials specifications, slip fit joint dimensions, pole component dimensions, welds that will be made, and the welding inspection that will be done.

Submit the mill certifications for the steel items (piles, plates, bolts, and other related items) to the Engineer for approval.

Design all poles for 100 mph winds with a 1.3 gust factor.

Design each electrolier to support a sign with an area of 16 square feet with its centroid located 14 feet above the base of the pole.

Fabricate signal and lighting structures from tapered steel tubes with a round or 16-sided cross section. Orient hand holes located near the base of poles to face down-stream of traffic flow.

Furnish poles and mast arms up to 40 feet long in one piece. Poles and mast arms longer than 40 feet may be furnished in one piece or in two segments with a slip type field splice. For slip type joints, provide a minimum overlap of two feet or 1.5 times the inside diameter of the female section whichever is larger. In mast arms, locate these splices at least one foot away from the plan location of signal heads and signs. In signal poles, locate the edge of the female section at least six-inches above the top of the signal mast arm connection.

Fabricate tubes with walls up to ½-inch thick from the prequalified base metals listed in AWS D1.1 and which feature maximum yield strengths of 70,000-psi. Fabricate elements greater than ½-inch thick from steel that conforms to ASTM A 709 and meets the Fracture Critical Impact Test requirements for zone 3. The Department will not accept structures that contain or are made with laminated steel elements.

Fabricate each tube from no more than 2 pieces of steel. When using 2 pieces, place the longitudinal welded seams directly opposite one another. Place the welded seams on adjacent sections to form continuous straight seams from the base to the top of the pole.

When tenons are needed to install traffic signals and luminaires, make them from two inch nominal schedule 40 pipe that conforms to ASTM A 53 Grade B.

Fabricate 10 feet long signal posts from 11 US Standard Gage sheet steel. Fabricate each post with a minimum inside diameter of five inches at the base plate. Use a 3½-inch long piece of four inch nominal schedule 40 pipe that conforms to ASTM A 53 Grade B as a post-top adapter.

The Department does not allow holes made for lifting purposes in the ends of tubular segments, except in the free ends of luminaire mast arms. To add lift points, weld them to the tube opposite the longitudinal seam weld on the outside of female segments and on the inside of male segments. Before shipment, remove all lift points added to the outside of the tubes, grind the area smooth with the base metal, and hot stick repair the finish according to subsection 660-3.01.8.a. You may leave the lift points added to the inside of tubes in place.

Hot-dip galvanize lighting and signal structures to meet AASHTO M 111 and these specifications. Completely submerge pole and mast arm segments in one dip in a kettle of concentrated zinc ammonium chloride flux solution heated to 130 °F, then completely submerge in one dip in a separate kettle of prime western grade zinc heated to approximately 825 °F. Galvanize bolts and fasteners to meet AASHTO M 232.

After the poles and mast arms are galvanized, remove all excess zinc from all drip lines and points and the surfaces of all tube ends that form slip type joints to provide a smooth finish.

The Department will reject poles and mast arms that are:

1. Not fabricated according to these specifications or the approved shop drawings,

2. Bowed with sweeps exceeding ¾ inch throughout the length of the pole, mast arm, or segment, if you furnish a two-piece pole or mast arm,

3. Out of round. Sections are out of round when the diameters of round members or the dimension across the flats of multi-sided members exceed two percent of the dimension specified on the shop drawings.

Fabricate pile cap adapters from grade X42 steel line pipe that conforms to API 5L and from steel plate that conforms to ASTM A 709 Grade 50. Attach the anchor plate to the pile section with a complete joint penetration (CJP) weld. Fabricate the anchor plate to match the base plate of the lighting standard.

Perform welding to conform to subsection 504-3.01 8. Welding and the following:

1. Make welds continuous.

2. Use partial joint penetration (PJP) welds in longitudinal seams. PJP welds must provide at least 60% penetration.

3. Use CJP groove welds to connect base plates to tubes with walls 7/32 inch thick and thicker. When CJP groove welds are used, the designer may use additional fillet welds when deemed necessary.

4. Use socket-type joints with two fillet welds to connect base plates to tubes with walls less than 7/32 of an inch thick.

5. On steels 5/16 of an inch thick and thicker, inspect 100 Percent of CJP welds by either radiography (RT) or ultrasound (UT).

6. On steels between 7/32 and 5/16 of an inch thick, inspect 100 Percent of CJP welds by UT per annex K of AWS D1.1.

7. Inspect a random 25 percent of PJP and fillet welds by magnetic particle (MT). If a defect is found, inspect 100% of the PJP and fillet welds made to fill the order. In steels less than 1/8 inch thick, complete the tests per AWS D1.3.

8. Only visually inspect welds made on luminaire mast arms.

Finish the edges of poles and mast arms to conform to the following requirements. Before they are hot dip galvanized, neatly round the following features to the radius specified:

1. On all holes through which electrical conductors pass, provide a 1/16-inch radius on both the entrance and exit edges,

2. On all pole base plates, provide a 1/8-inch radius on all edges along which plate thickness is measured and a smooth finish on all other exposed edges,

3. On the ends of all tubes that form slip type joints, complete the following tasks on the two surfaces that contact one another. First, provide 1/16-inch radii on the inside and outside edges of the female and male segments, respectively. Then for the length of the joint plus six inches do two things: grind down all welds until they feature a radius concentric with the mating surface and remove all material protruding from the two surfaces, and

4. Grind exposed welds flush with the base metal, except fillet welds and seam welds on top of mast arms. Grinding seam welds on multi-sided poles is not required, except in slip type joints.

Provide caps to cover the free ends of poles and mast arms.

Identify critical information for poles and arms with visible permanent aluminum tags that contain the information shown in Table 740-1. The measurements shown are for illustration purposes only. Use tags large enough to include all required information using ¼ inch high text, 3/8 inch of space between successive lines of text, and at least 3/8 inch of space between the edges of the tag and the text. Secure the tags with two 1/8 inch blind rivets at the base of poles and the under side of mast arms. If you furnish a two-piece signal mast arm with slip type joint, mark both pieces with the same message.

TABLE 740-1
POLE MARKINGS

Note: *Italic type indicates additional Tag Markings if poles have 2 luminaire or 2 signal mast arms.*		
	MEASUREMENTS	**TAG MARKINGS**
Signal Poles		
a) Signal mast arm length	45 ft./*55 ft.*	SMA 45/*SMA 55*
b) Luminaire mast arm length	22 ft./*18 ft.*	LMA 22/*LMA 18*
c) Pole height	36 ft.	PH 36
d) Intersection number (if more than one) -pole number		1 - P 4
e) Sum of signal mast arm moments about centerline of signal pole		SM 4000/*SM 3200*
f) Design wind speed	100 mph	DWS 100
Light Poles		
a) Luminaire mast arm length	15 ft./*15 ft.*	LMA 15/*LMA 15*
b) Pole height	37 ft.	PH 37
Signal Mast Arm		
a) Mast arm length	40 ft.	SMA 40
b) Intersection number (if more than one) -pole number		1 - P 4
c) Sum of signal mast arm moments about		SM 3740

Note: *Italic type indicates additional Tag Markings if poles have 2 luminaire or 2 signal mast arms.*		
	MEASUREMENTS	**TAG MARKINGS**
centerline of signal pole		
d) Design wind speed	100 mph	DWS 100
Luminaire Mast Arm		
a) Mast arm length	18 ft.	LMA 18
b) Pole number (if unique arm design)		P 4

740-2.03 WOOD POLES. Use wood poles for service or temporary installations of the class shown on the Plans or as specified in the Special Provisions.

Use 35-foot poles; except for service poles use 25-foot poles.

Use mast arms and tie rods for wood pole installations that conform to subsection 740-2.02, and to the details shown on the Plans. Provide each mast arm with an insulated wire inlet and wood pole-mounting bracket for mast arm and tie rod cross arm.

Use structural timber meeting Section 713. Do not use poles that have more than 180 degrees twist in grain over the full length. Ensure that the sweep is no more than four inches. For wood poles that are not to be painted after fabrication, furnish treated wood poles that meet Section 714.

740-2.04 NOT USED.

740-2.05 CONDUCTORS. Use conductor sizes based on the American Wire Gage (AWG). Use sizes that conform to the Plans or, when not shown, to this subsection.

Use insulated conductors made of uncoated, stranded copper that conforms to the specifications of ASTM B 8. Use grounding conductors that are bare copper of the gage required by the NEC. They may be stranded, solid, or braided.

Provide the following markings on the outer coverings of conductors and cables on intervals of 24 inches or less: manufacturer, the number of conductors or pairs in cables, conductor size, 600V, the conductor or cable type and environmental conditions for which the conductor or cables are listed, and the symbol of an approved independent testing laboratory.

Use conductors meeting the referenced specifications for the following purposes:

1. Power Conductors. For individual conductors, install general-purpose building wire manufactured according to UL Standard 44, ICEA S-66-524, and NEMA No. WC7. Furnish conductors insulated with cross-linked polyethylene listed as type XHHW-2 and rated for 600 volts AC operation.

TABLE 740-2
CONDUCTOR TERMINATION TABLE

CONDUCTORS PER CABLE	CIRCUIT	WIRE COLOR	AWG. NO.	BAND LEGEND
5	Vehicle Red Vehicle Yellow Vehicle Green Common Neutral Spare	Red Orange Green White Black	14	Head No.
7	Vehicle Red Arrow Vehicle Yellow Arrow Vehicle Green Arrow Common Neutral Spare Spare Spare	Red Orange Green White White/Black Black Blue	14	Head No.
7	Vehicle Red Vehicle Yellow Vehicle Green Common Neutral Spare Vehicle Yellow Arrow Vehicle Green Arrow	Red Orange Green White White/Black Black Blue	14	Head No. (s)
5	Pedestrian Don't Walk Pedestrian Walk Common Neutral Spare Spare	Red Green White Orange Black	14	Head No.
5	Photo Electric Control Load to Contactor Neutral Spare Spare	Black Red White Orange Green	14	PEC
2	Pedestrian Pushbutton Neutral	Black White	14	Head No. Located Under
2	Flashing Beacon Neutral	Black White	14	Head No.
2	Preemption Neutral	Black White	14	"PRE"
3	Highway Luminaire Highway Luminaire Highway Luminaire	Black Red White	8 or 6	Circuit No.

CONDUCTORS PER CABLE	CIRCUIT	WIRE COLOR	AWG. NO.	BAND LEGEND
	Spare			
3	Service to Controller Neutral Spare	Black White Red	6	"SIG"
3	Sign Luminaire Sign Luminaire Sign Spare	Black Red White	8	SIGN

Use size 10 AWG wire for illumination tap conductors. In an electrolier, the illumination tap conductors run from the fused disconnect kit to the ballast in the luminaire. Furnish conductors with black, red, or white colored insulation as required to identify the two phase and neutral conductors, respectively.

If conductors in controller cabinets carry the full signal load circuit, use size 10 AWG or larger conductors. Use orange colored conductors from the flash transfer relay to program emergency flashing operation.

2. Illumination Cables. For cables that consist of three size 6 or 8 AWG conductors, furnish power cables that feature three conductors, each insulated with cross-linked polyethylene, and a black, low density, high molecular weight polyethylene jacket. Use insulated conductors listed as type XHHW-2. Furnish these cables with one black, one white, and one red colored conductor and no grounding conductor. Use cables rated for 600 volts AC operation.

   Use insulated conductors meeting ICEA S-66-524 and UL Standard 44. The jacket must also meet ICEA S-66-524.

3. Power Cables. For cables that consist of three size 4 AWG and larger conductors, furnish tray cables that feature three conductors, each insulated with cross-linked polyethylene that meets the requirements of XHHW-2, and a PVC jacket. Furnish these cables without an integral grounding conductor. Use cables manufactured according to UL Standard 1277, ICEA S-95-658, and NEMA No. WC70. Provide cables listed for direct burial and resistance to sunlight and rated for 600 volts AC operation.

   Furnish these cables with black conductor insulation with one printed number (1, 2, or 3) identifying each conductor.

4. Control Cables. Wire with signal cable meeting IMSA 20-1 vehicular signal heads, pedestrian signal heads, pedestrian push button detectors, flashing beacons, hardwired local coordination and preemption devices, and photoelectric controls.

5. Detector Loops. Use a PVC insulated, nylon jacketed, 14 AWG copper conductor loosely encased in a polyethylene tube. The assembly shall conform to IMSA Specification 51-5.

6. Loop Lead-In Cables. Unless otherwise specified, use a tray cable that conforms to the following specifications to connect the loop detectors to the terminal blocks in the controller cabinet. Furnish this cable, also known as Snyder Cable, manufactured according to UL Standard 1277. Supply these cables third party certified as Type TC and certified for use in underground conduit or as an aerial cable supported by a messenger, and rated for 600 volts AC operation.

Furnish Snyder Cables with seven-pair size18 AWG, 16 strand, tinned copper conductors per ASTM B 33 insulated with flame-retardant polyvinyl chloride (PVC) and clear polyamide (nylon). Furnish conductors with insulation colors that match Table 660-1 twisted into pairs.

Provide each twisted pair with an overall aluminum foil coated mylar shield that provides 100% coverage and a 20 AWG tinned copper drain wire that is in constant contact with the foil side of the shield. Apply a tight fitting polyvinyl chloride jacket over the conductor assembly.

Only use the following loop lead-in cable, also known as shielded data cable, to rewire existing traffic signals when specified. Use cables that consist of 6 twisted pairs that consist of stranded, size 18 AWG tinned copper wire and polyethylene or polypropylene insulation. Furnish each pair covered with an aluminum foil shield, stranded copper drain wire, and an overall PVC or PE jacket. Use cable rated for 300 volts and whose colored pairs match those specified in Table 660-1.

7. Telemetry Cable. Use interconnect cable that consists of solid copper conductors of the number of pairs called for in the Plans meeting the requirements of Rural Utilities Service (formerly the Rural Electrification Administration (REA) specification PE-39 for filled telephone cables. The shield may be either copper or aluminum.

TABLE 740-3
INTERCONNECT TERMINATION TABLE

TELEMETRY CABLE: Type PE-39, No. 19 or No. 22 AWG, Solid Copper, as noted on the Plans or in the Special Provisions.					
PAIR No.	**COLOR**	**PAIR No.**	**COLOR**	**PAIR No.**	**COLOR**
1	Blue White	9	Brown Red	17	Orange Yellow
2	Orange White	10	Gray Red	18	Green Yellow
3	Green White	11	Blue Black	19	Brown Yellow
4	Brown White	12	Orange Black	20	Gray Yellow
5	Gray	13	Green	21	Blue

TELEMETRY CABLE: Type PE-39, No. 19 or No. 22 AWG, Solid Copper, as noted on the Plans or in the Special Provisions.					
PAIR No.	**COLOR**	**PAIR No.**	**COLOR**	**PAIR No.**	**COLOR**
	White		Black		Violet
6	Blue Red	14	Brown Black	22	Orange Violet
7	Orange Red	15	Gray Black	23	Green Violet
8	Green Red	16	Blue Yellow	24	Brown Gray
				25	Gray Violet

740-2.06 ELECTRICAL CONDUIT AND FITTINGS.

1. Rigid Metallic Conduit. Use UL Standard UL-6 galvanized conduit and fittings that are rigid metal type and manufactured of mild steel according to ANSI Standard C80.1.

2. Rigid Nonmetallic Conduit. For loop detectors, use UL Standard UL-651 Schedule 80 rigid polyvinyl chloride (PVC) conduit. Use PVC fittings meeting NEMA TC 3.

   When polyethylene conduits are specified in the Plans, use a smooth wall, schedule 40, high-density polyethylene (HDPE) pipe that conforms to UL 651 B.

Furnish insulated throat grounding bushings made of malleable iron or steel with a mechanically galvanized or zinc plated finish. Grounding lugs shall either be an integral part of the bushing or consist of an attached tin-plated copper saddle. All grounding lugs shall feature a stainless steel screw, the centerline of which falls within 20 degrees of conduit centerline. The bushings furnished shall also feature a stainless steel or brass mounting screw that locks the bushing onto the conduit end.

At expansion joints, provide watertight expansion fittings capable of the following movements without damaging the conduits attached to it or the conductors that pass through it. The movements include: axial expansion or contraction to ¾-inch, angular misalignments in any direction to 30 degrees, and parallel misalignment of the conduits to ¾-inch. The fittings shall also include a braided-copper bonding jumper equal to an 8 AWG conductor, bushings to prevent scraping the conductors, and a smooth inner sleeve that maintains a constant diameter regardless of conduit alignment.

740-2.07 FUSED SPLICE CONNECTORS. Use fused, quick disconnect, splice connector that is weather tight and has two halves: a single-unit line side socket and a load-side plug. Use fuses that are 10 ampere, midget (3/8-inch x 1½ inch) ferrule type with a fast acting current limiting (KTK type) design.

740-2.08 NOT USED.

740-2.09 NOT USED.

740-2.10 NOT USED.

740-2.11 NOT USED.

740-2.12 NOT USED.

740-2.13 NOT USED.

740-2.14 NOT USED.

740-2.15 NOT USED.

740-2.16 NOT USED.

740-2.17 NOT USED.

740-2.18 ROADWAY LUMINAIRES. Furnish luminaires that conform the following specifications and provide the light distributions specified. When luminaire performance criteria are specified, luminaires shall also:

- Meet or exceed the minimum initial light levels indicated.
- Provide light distribution uniformity ratios and veiling luminance ratios equal to or less than the maximums indicated.

When luminaire performance criteria are specified, submit the following information for each luminaire type and light distribution type specified: luminaire specifications, the lumen output of the lamps that will be furnished, and current electronic photometric data to the Engineer for approval. Furnish the photometric data in Illuminating Engineering Society (I.E.S.) format. The Engineer will use software that calculates light levels and uniformity ratios according to the American National Standard Practice for Roadway Lighting, A.N.S.I./I.E.S RP-8 to verify each luminaire provides the light levels, uniformities, and veiling luminance ratios specified.

When cut off distributions are specified, furnish luminaires with flat glass lenses and a full cutoff light distribution as defined in the American National Standard Practice for Roadway Lighting, A.N.S.I./I.E.S RP-8, dated 2000.

Furnish each luminaire with a high pressure sodium lamp of the wattage specified and matching ballast with an input voltage equal to circuit voltage. Furnish lamps that feature a rated life of 24,000 hours based on 10 hours per start and ballasts that conform to subsection 740-2.21.

Install luminaires that feature:

1. Corrosion-resistant enclosures with gray paint finish and space for the ballast.
2. Third party certification for use in wet locations.
3. Glass lenses, unless polycarbonate resin refractors are specified.
4. Terminal blocks for attaching the illumination tap conductors.
5. Aluminum reflectors with an ALZAK or ALGLAS finish.
6. Optical components free of substances that affect photometric performance, e.g. paint.
7. Housings cast with no provision for a photoelectric control receptacle.
8. Airtight reflector and lens units that breathe through activated charcoal filters and include elastomer gaskets to seal the gap between the two components. Gasket material must withstand the temperatures involved and be securely held in place.
9. Plug-in starting aids in fixtures with lamps through 400 watts.

Each cobrahead luminaire shall also include:

- An easily removed hinged door used exclusively for mounting the ballast.
- A second door that frames the lens, hinges on the house side, and fastens on the street side with an automatic type latch.
- A four-bolt mounting brackets that fit two-inch nominal diameter standard pipe and feature a center pivot for leveling the luminaire.

When polycarbonate resin lenses are specified, furnish lenses the fabricator certifies conforms to the following criteria.

1. The lenses are molded in a single piece from virgin polycarbonate resin.
2. The lenses are free from cracks, blisters, burns, and flow lines, and furnished with the natural molded surface.
3. The lenses are of uniform density throughout and free from air, gas, or moisture pockets, and uncured areas.
4. The lenses are transparent with a clear bluish tint, produced from ultraviolet stabilized resin to reduce the effects of ultraviolet radiation on their color properties.
5. The resins used meet the requirements for the self-extinguishing classification of ASTM D 635 and feature a minimum impact strength, Izod notched of 12 foot-pounds per inch when tested according to ASTM D 256, Method A, using a 1/8 inch by ½ inch bar molded according to ASTM recommended practice.

740-2.19 NOT USED.

740-2.20 ILLUMINATION CONTROL. Use photoelectric controls capable of directly switching multiple lighting systems. Furnish photoelectric units designed for pole top mounting that include a slip-fitter, terminal block, and cable supports or clamps to support pole wires.

1. Photoelectric Unit. A light sensitive element connected directly to a normally closed, single-pole throw control relay without intermediate amplifications. Plug the unit into a phenolic resin twist lock receptacle set in a cast aluminum mounting bracket with a threaded base. Screen photoelectric units to prevent artificial light from causing cycling.

Use either horizontal sensing or zenith sensing type units meeting the following:

a. A supply voltage rating of 60 Hz, 105-277 volts
b. A maximum rated load at a minimum of 1,800 volt-amperes
c. An operating temperature range from -40 °F to +150 °F
d. A power consumption of less than 10 watts
e. A unit base with a 3-prong, EEI-NEMA standard, twist-lock plug mounting

Furnish units for highway lighting that have a "turn-on" between one and five footcandles and a "turn-off" at between 1.5 and 5 times "turn-on."

Measurements must meet the procedures in EEI-NEMA *Standards for Physical and Electrical Interchangeability of Light-Sensitive Control Devices Used in the Control of Roadway Lighting*.

740-2.21 BALLASTS. Include ballasts for high intensity discharge lamps rated for the voltages and lamp types specified. Furnish ballasts with starting currents less than operating currents.

Furnish regulator-type ballasts with copper windings electrically isolated from each other, which will start and operate the lamps in temperatures down to -40 °F. The allowable line voltage variation is plus and minus 10%.

Equip high-pressure sodium luminaires, except those with 1000 watt lamps, with magnetic regulator ballasts with the following additional operating characteristics:

1. The lamp wattage regulation spread over the life of the lamp must not exceed 18% of nominal lamp watts at plus and minus 10% line voltage variations.

2. With nominal line and lamp voltages, the ballast must regulate the lamp output to within 5% of the ballast design center, and sustain lamp operation with a minimum 60% voltage drop lasting 4 seconds or less.

Submit the ballast manufacturer's specification sheets for review and approval.