PART 4

STANDARD MODIFICATIONS

AND SPECIAL PROVISIONS

to the STATE OF ALASKA

STANDARD SPECIFICATIONS
FOR
HIGHWAY CONSTRUCTION

2004

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. (06/30/04)E18

102-1.11 ADDENDA REQUIREMENTS. Delete this Subsection in its entirety and substitute the following: Addenda will be issued to the individual or company to whom bidding documents were issued. Addenda may be issued by any reasonable method such as hand delivery, mail, telefacsimile, telegraph, courier, and in special circumstances by phone. Addenda will be issued to the address, telefacsimile number or phone number as stated on the planholder's list unless picked up in person or included with the bid documents. It is the bidder's responsibility to insure that he has received all addenda affecting the Invitation For Bids. No claim or protest will be allowed based on the bidder's allegation that he did not receive all of the addenda for an Invitation For Bids.

Addenda shall be acknowledged on the Proposal or by telegram or telefacsimile prior to the scheduled time of bid opening. If no addenda are received by the bidder, the word "None" should be entered on the Proposal Form. (06/08/052/1/00)R171M98USC04

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.	
Statewide	800-478-3121
who will notify the following:	
Alaska Railroad Corp	
City of Palmer	
DOT Street Lights, State of Alaska	
Enstar Natural Gas	
General Communications Inc.	
Matanuska Electric Assoc	
Matanuska Telephone Assoc	

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. Cooperate with these utilities and coordinate schedule of work to allow them access to the project for their adjustments and/or relocation.

Work around those utilities not designated for relocation in the plans and the following utility specific coordination. The Contractor shall bear the expense for changes or additional relocation requested for the Contractor's convenience.

Work around utility facilities, either existing or relocated, throughout the project unless advised by the utility that the facility is abandoned in place.

The Contractor shall bear the responsibility for changes in contract scheduling that result in the conditions in this specification not being met. Additional coordination with the applicable utility will be required.

Schedule and coordinate the utility relocations with project construction as set forth in Section 108-1.03, Prosecution and Progress.

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 and/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 Companies shall give the Contractor, through the Engineer, fifteen (15) calendar days advance written notice for required staking.

Provide the Utility Companies fifteen (15) calendar days advance written notice for relocations, provide a copy of the notice to the Project Engineer. 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.

Prior to any of the relocations listed below the identified areas will be slope staked with pipe locations and grading information also provided. During relocation work provide all required traffic control and flagging for the Utility's, this work will paid under the applicable 643 items.

Specific coordination requirements for the specific utilities are included below:

Enstar Natural Gas Company (Enstar): has existing underground facilities located within th project that will require adjustment. Notify Enstar by calling 907-264-3712 to establish a point of contact and to determine where to send the written notice. iceThe following existing facilities have been identified as potential conflicts.

Location No.	Station	Type of Facility	Calendar Days Required For Relocation
1.	147+45, Rt.	Gas Line	4
2.	149+00 Rt.	Gas Line	4
3.	152+23, Rt.	Cathode	4
4.	152+40 Rt.	Gas Line	4
5.	155+60 Rt.	Gas Line	4
6.	158+82, Rt.	Cathode	4
7.	171+35 Lt.	Gas Line	3
8.	171+75 Rt.	Gas Line	3

In addition service lines at the following locations will require extension outside the roadway by Enstar:

Location No.	Station	Type of Facility	Calendar Days Required For Relocation
1.	159+65 Rt.	Gas Line	3
2.	160+62 Rt.	Gas Line	3
2.	161+55 Rt.	Gas Line	3
3.	163+29 Rt.	Gas Line	3
4.	164+25 Lt.	Gas Line	3
5.	165+25 Rt.	Gas Line	3

General Communication Inc. (GCI) has existing underground facilities located within this project that will require adjustment. Notify GCI by calling 907-868-6157 to establish a point of contact and to determine where to send the written notice. The following existing facilities have been identified as potential conflicts.

Location No.	Station	Type of Facility	Calendar Days Req'd For Relocation
1.	146+30, Rt. to 146+80, Rt.	Buried Coaxial Cable & Pedestal	5
2.	147+00, Rt.	Buried Coaxial Cable	3
3.	147+45 Rt. to 149+00, Rt.	Buried Coaxial Cable	4
4.	156+75, Rt.	Pedestal & Buried Coaxial Cable	4
5	158+10, Rt.	Pedestal & Buried Coaxial Cable	4
6.	158+50, Rt.	Buried Coaxial Cable	4
7.	159+75, Rt.	Aerial Coaxial Cable	6
8.	169+12, Rt.	Aerial Coaxial Cable	6
9.	169+90, Rt.	Aerial Coaxial Cable	6

Location 7 through 9: Coordinate and provide all the necessary approach grading information in these locations to GCI. When the required staking is completed notify GCI.

Matanuska Electric Association Inc. (MEA): has existing aerial facilities located within the project that will require adjustment. Notify MEA by calling 907-761-9283 to establish a point of contact and to determine where to send the written notice. The following existing facilities have been identified as potential conflicts:

Station 152+10 Rt. - MEA's underground facilities cross under the proposed ditch and may require lowering. Once the ditch has been staked and the extent of conflict identified MEA will require four (4) calendar days to complete the relocation.

Station 156+90 - MEA's underground facilities cross under the proposed ditch and

may require lowering. Once the ditch has been staked and the extent of conflict identified MEA will require four (4) calendar days to complete the relocation.

Station 158+05 Rt. - MEA's underground facilities cross under the proposed ditch and may require lowering. Once the ditch has been staked and the extent of conflict identified MEA will require four (4) calendar days to complete the relocation.

Station 158+40 Rt. – MEA's existing pole is in conflict with the road improvements. MEA will require four (4) calendar days to complete the relocation.

Station 168+33 Lt. – MEA's existing light pole is in conflict with the road improvements and will require removal. The light shall not be removed until such time as it is not required by summer conditions or provisions are made to replace the light with permanent project lighting. MEA will require two (2) calendar days to complete the relocation.

MEA's poles which fall within the proposed ditch line will require slope staking at each location to verify the extent of conflict. Once the staking has been provided MEA shall be notified and allowed to inspect the amount of cut at each location prior to the cuts being made.

Matanuska Telephone Association Inc. (MTA): has existing underground and aerial facilities within this project limits that will require adjustment. Notify MTA by calling 907-761-2544 to establish a point of contact and to determine where to send the written notice. The following existing facilities have been identified as potential conflicts.

Location No.	Station	Type of Facility	Calendar Days Req'd For Relocation
1.	145+62, Lt	Buried Road Crossing Road Cable	5
2.	171+35, Lt & Rt.	Buried Road Crossing Fiber Optic Cable	5

MTA will adjust their facilities as required once the staking has been provided and the extent of the conflicts has been identified. (04/01/03)R3M98

105-1.07 COOPERATION BETWEEN CONTRACTORS. Add the following:
The following other ADOT projects will be under construction concurrently with this project:

1. Dogwood, project #57851
2. Mat-Su Roads, project #57427
3. Palmer Urban, project #55430
4. Wasilla Crusey, project #55006

Coordinate traffic control, construction, and material hauling operations with the prime contractor of the above projects to minimize impact on the traveling public, and to minimize conflicts with the work being performed under the other contracts. (02/01/00)R175M98

Standard Modifications

105-1.16 FINAL ACCEPTANCE AND RECORD RETENTION. Modify the first paragraph, Item 4., after: "DOLWD" add: and State Department of Revenue. (06/30/04)E19

Special Provisions

105-1.17 CLAIMS. Add the following Any appeal to the superior court under AS 36.30.685 must be filed in the third judicial district. (3/21/01)R93

SECTION 106

CONTROL OF MATERIAL

Special Provisions

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 shall submit a completed Material Origin Certificate, Form 25D-60, before award of the contract.

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 $2500, 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), scrap, 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 that 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 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. (02/07/05)S13

SECTION 107

LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Special Provisions

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 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, impacted by the Contractor's operations. These delineations will be subject to Corps of Engineers approval. The Contractor is required to obtain any required Corps of Engineers permits for work outside the project limits.

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.

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

1. Alaska Department of Environmental Conservation, Non-domestic Storm Water Disposal Plan, letter of non-objection, Tracking No. 05-WW-188-001.

Provide information to comply with the US Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) General Permit for Alaska to discharge storm water from the construction site. Refer to Section 641, Erosion, Sediment, and Pollution Control for requirements for this permit.

(05/29/02)R7M98

107-1.07 ARCHAEOLOGICAL OR HISTORICAL DISCOVERIES. Change the first sentence to the following: When operations encounters historic or prehistoric artifacts, burials, remains of dwelling sites, paleontological remains, (shell heaps, land or sea mammal bones or tusks, or other items of historical significance), cease operations immediately and notify the Engineer. (05/29/02)R7M98

107-1.11 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE. Add the following: If you require water for construction purpose from

a non-municipal water source, obtain a Temporary Water Use Permit from the Water Resource Manager, and provide a copy to the Engineer. The Water Resource Manager is with the Department of Natural Resources in Anchorage and may be contacted at (907) 269-8624. (05/29/02)R7M98

The Contractor shall report immediately to the Engineer any hazardous material discovered, exposed, or released into the air, ground, or water during construction. The Contractor shall also report any containment, cleanup, or restoration activities anticipated or performed as a result of such release or discovery. Hazardous materials include, but are not limited to, petroleum products, oils, solvents, paints, and chemicals that are toxic, corrosive, explosive, or flammable. (sw-pih)

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 Provisions

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

108-1.04 LIMITATION OF OPERATIONS. Add the following: Complete all work designated on the Typical Sections between the top back of curbs or outermost pavement edge, whichever is further, on or before August 15, 2006.

All work between the top back of the left and right curbs north of Station 171+60 may not begin until May 25, 2006.

SECTION 109

MEASUREMENT AND PAYMENT

Special Provisions

109-1.02 MEASUREMENT OF QUANTITIES. Under subtitle Electronic Computerized Weighing System item (1) add the following to the end of the first sentence: ", CD, or a USB device."

109-1.05 COMPENSATION FOR EXTRA WORK. Under item 3. Equipment, item a. add the following to the second paragraph: The rental rate area adjustment factors for this project shall be as specified on the adjustment maps for the Alaska - South Region. (4/31/05)R14

109-1.07 PAYMENT FOR MATERIAL 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. (09/01/89)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. (06/30/04)E11

Add the following section:

SECTION 120

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM

Special Provisions

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. The Contractor shall 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 commercially 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 Engineer makes the determination of CUF 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, the Contractor shall 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 the Engineer approves a DBE replacement, the Contractor shall 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 judgement 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. The bidder may reject non-competitive DBE quotes. 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. The bidder must exercise such an opportunity 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 DBE Liaison Officer will make the decision on reconsideration.

   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 US 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 effect 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) Unless the Engineer's approval is given before subletting, use the same unit of measure as contained in the Bid Schedule for subcontract work, with the exception of truck hauling.

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, the Contractor shall 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 payor, 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 US 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, the Contractor shall immediately notify the Engineer of the default and the circumstances surrounding the default.

The Contractor shall 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)S 33

SECTION 202

REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Special Provisions

202-3.01 GENERAL. Add the following Carefully remove fences designated by the Engineer or as specified on the plans. 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.

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

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. A DEC permitting officer in Anchorage may be contacted at (907) 269-7590. (03/29/01)R84USC

Add the following Subsection:

202-3.06 SALVAGING. Notify the Engineer a minimum of five (5) days before removing manholes and inlets. The Engineer will notify DOT&PF M&O and upon excavation have an M&O representative identify manholes, inlets or portions thereof to be salvaged. Deliver items designated for salvage to the local DOT&PF M&O yard. Items not designated for salvage by DOT&PF M&O shall become the Contractor's property. (07/08/03)R258M98

202-5.01 BASIS OF PAYMENT. Add the following:

Item 202 12C. Excavation beyond the limits of the adjacent mainline is subsidiary. Materials required to construct mailbox turnouts will be paid separately under the respective items listed in the bid schedule.

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)R17USC02

Add the following pay items:

Pay Item	Pay Unit
202(12A) Relocate Cluster Mailboxes	Each
202(12C) Mailbox Turnouts	Lump Sum
202(13) Removal of Fence	Linear Foot

SECTION 203

EXCAVATION AND EMBANKMENT

Special Provision

203-3.01 GENERAL. Add the following to the first paragraph: Do not survey the original ground for excavation quantity computations until after grubbing operations are completed.

Add the following to the last paragraph: Before obliterating the existing driveway, remove the existing pavement and dispose according to Subsection 202-3.05, Removal of Pavement, Sidewalks, and Curbs. (06/10/04)R177USC02

Add the following: Wait a minimum of 48 hours after staking is complete before commencing excavation activities. The Engineer, after staking by the Contractor, may adjust stationing of sections for best fit without additional compensation to the Contractor.

Use caution when performing work near the Mt. Rose Estates property to prevent damage to the existing trees or underground sprinkler/irrigation system. Damage to property shall be restored in accordance with Subsection 107-1.11 Protection and Restoration of Property and Landscape, at the Contractor's expense.

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 joints parallel to centerline offset from the joint below, by 1-foot.and transverse joints perpendicular to centerline offset from the joint below 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. Any reduction in excavation or Borrow quantities as a result 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.

(11/18/04)R23USC02

203-3.04 COMPACTION WITH MOISTURE AND DENSITY CONTROL. Delete this section in it's 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 percent of the maximum dry

density as determined by WAQTC FOP for AASHTO T 99 / T 180 or ATM 212. The Engineer will determine in-place field densities using WAQTC FOP for AASHTO T 310 and WAQTC FOP for AASHTO T 224. (nb-pih)

203-5.01 BASIS OF PAYMENT. Add the following: Payment for Item 203(9B) Obliteration of Driveway will also include removal and disposal of pavement and excess fill material. Payment for removal and disposal of culverts will be made under Item 202(4) Removal of Culvert Pipe.

Add the following pay item:

203(9B) Obliteration of Driveway	Each

SECTION 301

AGGREGATE BASE AND SURFACE COURSE

Special Provisions

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.

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. (09/01/89)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

Replace Section 401 with the following:

SECTION 401

ASPHALT CONCRETE PAVEMENT

Special Provisions

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.

MATERIALS

401-2.01 COMPOSITION OF MIXTURE - JOB MIX DESIGN. Meet the requirements of Table 401-1 for the Job Mix Design performed according to 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 according to 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 establish the approved Job Mix Design that will become a part of the Contract.

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 before 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.

Place the top layer of paving or surface course between May 1 and August 15. Place bottom and middle layers of asphalt, leveling courses, and treated bases according to the limitations of this Subsection. (07/03/03)S90

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 according to 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 (+1 inch) in width full depth, then fill using asphalt concrete, and tamp in place. Clean, wash, and sweep existing paved surfaces of loose material. The Engineer must approve existing surface before applying tack coat.

Preparation of a milled surface,

- 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.

Before 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 percent (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 according to 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 percent 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, if 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.

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

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 asphalt concrete mixture immediately after it is placed and spread, and as soon as it can be compacted without undue displacement, cracking or shoving. Perform initial breakdown compaction while the asphalt concrete surface mixture temperature is greater than 235°F and finish compaction before the surface temperature reaches 150°F. (07/03/03)E02

Use pneumatic tire rollers to compact Preleveling Asphalt Concrete, Type IV, Class B.

During placement of asphalt concrete the Engineer may evaluate the Hot Mix Asphalt (HMA) immediately behind the paver for cyclic low density using an infrared camera. 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 the 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, those areas will 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 percent 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 Job Mix Design will determine the MSG. 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 according to 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 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 of longitudinal joints with Crafco 34524 Joint Adhesive or approved equal before paving against it. 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 the panel completing the joint is cored for acceptance density testing. Density will be determined according to 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 REQUIREMENTS AND TOLERANCE. The Engineer will test the finished surface after final rolling at selected locations using a 10-foot straightedge. Correct at your own expense any variations from the testing edge, between any two contacts of more than 1/4 inch.

The finished surface of asphalt concrete paving shall match dimensions shown on the Plans for horizontal alignment and width, profile grade and elevation, crown slope, and paving thickness. Water shall drain without puddles, across the pavement surface. The surface shall be of uniform texture and without ridges, humps, depressions, and roller marks. The surface shall be free of raveling, cracking, tearing, rutting, asphalt cement bleeding, and aggregate segregation. The asphalt concrete mixture shall be free of foreign material, uncoated aggregate, and oversize aggregate.

Any finished surface area that does not meet the requirements of this Subsection is deemed unacceptable as per Subsection 105-1.11. The Engineer will determine whether the unacceptable asphalt concrete mixture shall either be corrected, or removed and replaced at the Contractor's expense. Submit correction methods to the Engineer for approval prior to correction work commencing. (07/03/03)E02

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 according to subsection 401-3.15 to grade and smoothness requirements.

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

401-3.17 TEMPERATURE REQUIREMENTS. The Engineer may reject asphalt concrete mixture that is mixed, hauled, spread and placed, or compacted at a temperature outside the temperature range determined by either the Job Mix Design, by a control test strip, or by the Specifications. Rejected asphalt concrete mixture is deemed unacceptable as per Subsection 105-1.11. The Engineer will determine whether the unacceptable asphalt concrete mixture shall either be corrected, or removed and replaced.

At the Engineer's discretion, the Contractor may be allowed to compact asphalt concrete mixture that is already placed and spread but is outside the temperature range. If the compacted asphalt concrete mixture fails the Engineer's tests for acceptance, it must be removed and replaced as per Subsection 105-1.11. (07/03/03)E02

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.

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 percent 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. ATM 405 or WAQTC FOP for AASHTO T 308 will determine percent of asphalt cement. 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 Engineer's presence before and after unloading. If the weight determined at the project varies more than 1 percent from the invoice amount, payment will be based on the weight determined at the project.

   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.

Temporary Pavement. By weighing. No deduction will be made for the weight of asphalt cement or anti-stripping additive.

Longitudinal Joint Adhesive and Sealing. By the linear foot of longitudinal joint.

Preleveling. By weighing. No deduction will be made for the weight of asphalt cement or anti stripping additive.

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 (JMD) and the placement and compaction of the hot mix asphalt to the specified depth and finished surface requirements and tolerances. Remove and replace any hot mix asphalt that does not conform to the approved JMD.

An area of finished surfacing that is visibly segregated, fails to meet surface tolerance requirements is considered unacceptable according to subsection 105-1.11.

1. Asphalt Cement. Samples for the determination of asphalt cement content will be taken from either the truck, the windrow in front of the paver, or at the end of the auger, or behind the screed before 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 according to 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 according to 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 either the combined

aggregate cold feed conveyor via a diverter device, or 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 according to WAQTC FOP for AASHTO T 27/T 11. For asphalt concrete mixture samples, the gradation will be determined according to 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 according to WAQTC FOP for AASHTO T 27/T 11. For asphalt concrete mixture samples, the aggregate gradation will be determined according to 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 including locations having low cyclic density. Use a core extractor to prevent damage to the core. The Engineer will determine the density of the core samples according to WAQTC FOP for AASHTO T 166/T 275. Do not core asphalt concrete pavement on bridge decks. Backfill and compact voids left by coring with new asphalt concrete mixture within 24 hours.

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 and 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. Sublot density values used will be lesser of either the random mat density or an average of cyclic low densities taken within the limits of the sublot.

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. 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. Cyclic low density will not be considered outliers.

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 percent of the maximum specific gravity (MSG), the LSL is 92 percent of MSG and the USL is 98 percent.

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.

   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.

Base = $41 per ton

The total asphalt concrete price adjustment is the sum of all price adjustments for each lot and will be adjusted under Item 401(6) Asphalt Price Adjustment.

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.

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

	Spec	Pay Reduction Factor (PRF)								
		0	**0.04**	**0.05**	**0.06**	**0.07**	**0.08**	**0.1**		**Reject or Engr Eval**
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
Tests On RTFO										
Mass Loss	<1.00 %	<1.00		1.001-1.092				1.093-1.184	1.185-1.276	>1.276
Dynamic Shear	>2.20 kPa	>2.20		2.199-1.816				1.815-1.432	1.431-1.048	<1.048
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

SECTION 504

STEEL STRUCTURES

Special Provisions

504-3.01 FABRICATION.

8. Welding. Delete items e and f in the second paragraph and substitute the following:

   e. Names and qualifications of the NDE technicians
   f. Type and extent of NDE to be conducted, as required in the specifications and as shown on the approved shop drawings.

SECTION 603

CULVERTS AND STORM DRAINS

Special Provisions

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. (08/27/03)R42USC

SECTION 604

MANHOLES AND INLETS

Special Provisions

604-1.01 DESCRIPTION. Add the following: This work shall also consist of cleaning the existing drainage system, including all manholes, catch basins, inlets, culverts inlets and culvert outlets.

604-3.01 CONSTRUCTION REQUIREMENTS. Add the following after the first paragraph: 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.

Under the sentence "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.

Add the following: Notify the Engineer a minimum of 5 days before removing the frame and grate. The Engineer will notify DOT&PF M&O (907-338-1466) and have an M&O representative physically identify frames and grates to be salvaged. Deliver frames and grates designated to be salvaged to the DOT&PF M&O yard located at 5300 East Tudor Road. Frames and grates not designated for salvage by DOT&PF M&O 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 nonshrinking cement mortar.

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.

Add the following subsection:

604-3.02 CLEAN DRAINAGE SYSTEM. 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 of 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.

604-3.03 REPLACE INLET GRATE. Existing inlet grates shall be removed from existing curb inlets where specified on the plans. The existing inlet grates shall become the Contractors property after removal.. Furnish and install bicycle safe grates which fit into the existing inlet curb inlet frames. Minimum inlet grate weight shall be 150 pounds.

604-4.01 METHOD OF MEASUREMENT. Add the following: Frames, grates, and lids will not be measured for payment except were specified in the plans under Item 604(13) Replace Inlet Grate.

Item 604(13) Replace Inlet Grate, will be measured by the number of units installed and accepted.

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. (02/28/05)R43USC04

Item 604(20) Clean Drainage System, payment will be made on a time and materials basis in accordance with subsection 109-1.05, Compensation for Extra Work. Traffic Control provided to clean storm drains will be paid under the 643 items.

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

Pay Item	Pay Unit
604(1A) Storm Drain Manhole, Type I	Each
604(13) Replace Inlet Grate	Each
604(20) Clean Drainage System	Contingent Sum

SECTION 608

SIDEWALKS

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 the following new subsection:

608-3.04 DETECTABLE 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 surface-applied tactile tile panels or molded-in-place epoxy systems when retro-fitting existing cured concrete ramps. Install tile so there are no vertical changes in grade exceeding 0.25 inch or horizontal gaps exceeding 0.5 inch. Align pattern on a square grid in the predominant 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 in accordance with Americans with Disabilities Act Accessible Guideline.

608-4.01 METHOD OF MEASUREMENT. Delete the "Curb Ramp" paragraph 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.

(06/30/04)E20

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

ADDENDUM No. 1
ATTACHMENT No. 6

SECTION 608

SIDEWALKS

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 the following new subsection:

608-3.04 DETECTABLE 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 surface-applied tactile tile panels or molded-in-place epoxy systems when retro-fitting existing cured concrete ramps. Install tile so there are no vertical changes in grade exceeding 0.25 inch or horizontal gaps exceeding 0.5 inch. Align pattern on a square grid in the predominant 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 in accordance with Americans with Disabilities Act Accessible Guideline.

608-4.01 METHOD OF MEASUREMENT. Delete the "Curb Ramp" paragraph 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.

(06/30/04)E20

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.

The 6" Entrance Pad and Ramps shown within the Vehicular Curb Cut Details shall be measured and paid for under 608(1a), CONCRETE SIDEWALK, 4 INCHES THICK.

(06/11/02)R256USC

SECTION 615

STANDARD SIGNS

Special Provisions

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

615-2.01 MATERIALS. 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.

(6/30/04)E13

Special Provisions

615-3.01 CONSTRUCTION REQUIREMENTS. Under item 7 add the following:

Deliver sign panels, posts and hardware to the State Maintenance Yard at 289 Inner Springer Loop Road in Palmer, Alaska.

615-3.02 SIGN PLACEMENT AND INSTALLATION. Add the following: Do not remove existing signs without authorization from the Engineer.

Add the following subsection:

615-3.03 RETROREFLECTORIZE SIGN POST. Apply a 2 inch wide strip of high intensity retroreflective white material to the front and back of each Crossbuck sign post at passive railroad crossings. Run strips the full length of the post from the Crossbuck or Number of Tracks sign to near ground level.

615-4.01 METHOD MEASUREMENT. Add the following: Retroreflectorize Sign Post will not be measured for payment.

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

No separate payment for Retroreflectorize Sign Post or work required to retroreflectorize posts or materials required for retroreflectorization will be made, but will be subsidiary to Item 615(1), Standard Sign.
(08/08/05)JP

SECTION 617

RAILROAD CROSSINGS

Special Provisions

617-1.01 DESCRIPTION. Add the following: This work includes railroad trackwork and construction items associated with this project to the limits shown.

This work will also include removal of existing track and crossing materials at the proposed road crossing.

This work shall consist of furnishing, placing, tamping and shaping railroad ballast and surfacing and aligning new and existing track, in conformance with the lines, grades and thickness' shown on the Plans.

The work involved in this project consists of, but is not necessarily limited to, the following activities:

1. Remove existing track to the excavation limits shown.

2. Install new track as specified on the Plans for the trackwork area.

3. Install permanent grade crossings.

This work consists of furnishing and constructing a concrete modular crossing to the alignment and location shown on the Plans. Installation of the modular crossing to the design grade lines will require the removal of existing ***delete*** line to permit excavation of unsuitable subgrade and ballast and complete tie renewal within the limits shown. Perform trackwork associated with the crossing replacement. Trackwork shall be scheduled with the ARRC through the Engineer. No portion of the existing track structure shall be removed before the approval of the Engineer that may be requested in writing seven (7) calendar days in advance of the work.

617-1.02 DEFINITIONS.

Delete the definition for item 2, Chief Engineer and replace with the following: The Engineer.

Add the following:

3. ARRC. Alaska Railroad Corporation

4. AREA. American Railway Engineering Association and its successor organization,

5. AREMA. American Railway Engineering and Maintenance-of-way Association.

6. W.C.L.I.B. West Coast Lumberman's Inspection Bureau

7. FRA. Federal Railroad Administration

Add the following Subsections:

617-1.03 REFERENCED STANDARDS.

1. ARRC Standard Plans, Ballast and Trackwork.

2. AREA/AREMA Manual for Railway Engineering–Fixed Properties

3. AREA/AREMA Portfolio of Trackwork Plans

4. Standards listed in each section of these specifications, but referenced thereafter by a basic designation only i.e. AREA/AREMA, form a part of the specifications to the extent indicated by the reference. The most recent edition of the standard at the time of advertising shall apply.

617-1.04 REFERENCED DRAWINGS. Alaska Rail Road Standard Drawings list on the title sheet of the Plans.

617-1.05 STORAGE. Storage facilities shall be in areas designated by the Engineer.

617-1.06 CLEAN-UP. At the end of each days work, the job site shall be cleaned up and left in a neat condition.

Before calling for a final inspection the entire premises shall be cleaned up to the satisfaction of the Engineer.

617-1.07 OWNERSHIP. Tracks and crossing materials replaced by new materials will become the Contractor's property.

617-2.01 MATERIALS. Add the following:

Modular Crossing Panels: Crossing panels shall be modular reinforced concrete panels specifically designed for railroad crossing applications. The particular manufacturer shall be regularly engaged in the fabrication of railroad crossing materials and the Engineer must approve the product, in writing. Panels will be screwed to the ties with ARRC approved lag screws. Manufacturers of reinforced concrete modular panels shall be one of the following or approved equal:

Century Concrete Crossings	800-527-5232
Omni Grade Crossing Systems	800-203-8034
American Concrete Products Co.	402-331-5775
KSA	412-227-2396
Premier Concrete RR Crossings	800-425-5556
Omega Industries, Inc.	360-694-3221
Magnum Manufacturing Corp.	801-785-9700

Submit the manufacturer's specifications for reinforced concrete crossing panels to the Engineer for approval.

Rail: Use unjointed 115# RE rail within the road crossing and for at least 20-feet on either side of the crossing.

Geotextile Fabric: Geotextile fabric shall be non woven fabric meeting the requirements of AREMA Chapter 1 and shall be heavy class. Fabric specifications and sample shall be submitted for review prior to purchase and installation.

Railroad Subballast. Subballast shall consist of material meeting the minimum requirements of Section 301, Aggregate Base Course, Type C-1. Prepared ballast shall be crushed shot rock or crushed pit-run rock, size no. 4A, composed of hard, strong and durable particles, free from injurious amounts of deleterious substances. Subballast shall meet the requirements of Subsection 703-2.14, Railroad Subballast.

The ballast shall be manufactured, handled, stockpiled and delivered that it is kept clean and free from segregation.

Railroad Track. Purchase and deliver track material to construct skeleton track. The material shall conform to the current AREA/AREMA "Manual for Railway Engineering" and as detailed in this specification.

1. New Standard Carbon Rail: Rail shall be 115# RE Rail Section and conform to the latest revision of the AREA/AREMA Manual, Chapter 4, Rail Specifications for steel rail and the ARRC Standard Plan 3.1. Rail shall be drilled at both ends. Rail shall be end hardened, 80 feet in length per AREA/AREMA Chapter 4, paragraph 2.1.11.

2. New High Strength Rail: Rail shall be 115# RE Rail Section and have a Brinell Hardness range of 341-388. Rail may be either head hardened or fully heat treated and conform to the latest revision of the AREA/AREMA Manual, Chapter 4, Rail Specifications for steel rail and the ARRC Standard Plan 3.1. Rail shall be drilled at both ends for 6-hole joint bars. Rail shall be 80 feet in length per AREA/AREMA Chapter 4, paragraph 2.1.11.

3. Track Spikes: Use Pandrol screws or approved screws.

4. Rail Anchors: Use Pandrol clips or approved rail anchors.

5. Tie Plates: Use Pandrol plates or approved plates.

6. Angle Joint Bars: Angle joint bars shall be new 36 inch headfree, standard toeless, 6 holes for 115# rail with hole spacing to fit rail drilling per ARRC plan 5.12. Joint bars shall be quenched or medium carbon steel, rolled steel only, heat #16. Hole diameter shall be 1-1/4 inch.

7. Track Bolts, Nuts & Washers: Bolts and nuts shall be new and manufactured according to AREA/AREMA Section 4.1.15. Bolts shall be of the appropriate size for the bolt hole of the rail and bar and sufficient length for a full nut, lockwasher and 1 ½ threads exposed after tightening, but not to exceed a 1 inch exposure after tightening. Lockwashers shall be new according to ARRC Plan No. 7 and sized for the bolt diameter.

8. Cross Ties: Cross ties shall be treated 7" x 9" x 10'-0" per ARRC Standard Plan 1.13. Cross ties shall be manufactured according to AREA/AREMA Manual for Railway Engineering, Chapter 3; W.C.L.I.B. Grading Rules #17, paragraph 192b; and this specification. Hardwood ties shall be used.

   a. Timber: Cross ties shall be sawn from sound, straight live timber, free from defects that might impair durability and/or strength. Multiples or combinations will not be accepted. Cross ties shall be cut square at the ends and have bark that impairs treatablility entirely removed.

   b. Stump Pull: Stump pulls will be graded the same as holes or splits in the end of a tie. Cross ties with a stump pull that goes into the interior more than 5 inches will be rejected.

   c. Wane: Cross ties shall have a minimum 8 inch face. Minimum face specifications apply to the entire length of the cross tie. Wane shall be free of bark.

   d. Knots: A knot exceeding in diameter 1/4 of the width that appears on the surface will be rejected if it occurs in the rail bearing area. Outside the rail bearing area, knots will be accepted up to a diameter of 1/3 of the surface they appear. A cluster of knots will be judged as being a large knot in damaging effect. Rail bearing area shall be defined as 20 inches to 40 inches from center of tie.

   e. Cross Grain: Any cross tie with cross grain exceeding one in fifteen will be rejected.

   f. Straightness: A cross tie will be considered straight when (1) a straight line along the top from middle of one end to middle of the other end is not closer than 3 inches from either side of tie, and (2) when a straight line along a side from middle on one end to the middle of the other end is more than 2 ½ inches from top or bottom of the tie.

   g. Bark: Cross ties containing more than a minimal amount of ingrown bark will be rejected.

h. Saw Kerf: A saw kerf is not required.

i. Mill of Manufacture Certification: A mill certification is required indicating that inspections have been performed and that the product conforms to the specifications. The mill certification must also indicate the species of wood. Ties that pass the inspection will be clearly marked and identified as ARRC ties; unmarked ties will not be accepted.

j. Treatment: Treatment shall meet the specifications of the American Wood Preservers Association Standards Book C6 ant the following guidelines. A treatment report shall be accurately completed for charges and at a minimum shall contain the following:

i Charge number
ii Date
iii Wood species and size
iv Total retort time in hours
v Conditioning time in hours
vi Pressing time in hours
vii Retention in pounds per cubic meter
viii Average penetration to be shown for oak
ix Initial air time, if applicable
x Gauge readings and times
xi Treating operator's signature
xii Seasoned condition (dry or green), if green show moisture content.
xiii Final Vacuum
xiv Wright of solution at 100° F
xv Work tank number and cylinder number

The preservative shall consist of a mixture of 50 percent by volume of creosote oil and 50 percent by volume of residuum oil; 50/50 coal tar solution may also be used. Final readings shall be entered on the treating report. Treating reports and charts shall become a permanent record maintained by the treating company with open access to ARRC personnel.

k. Care of Treated Wood: Extreme care shall be used in handling treated cross ties to avoid damage to the edges of the timbers or breaking through the treated portions and exposing untreated wood. The use of peavies, cant hooks, pickaroons, long hooks or pointed tools shall be such as not to break through the treated portion of the wood. Material shall be retreated at the vendor's expense if damage during handling that could potentially impair the longevity of material service life. Cost associated with retreatment, including oil, shall be the responsibility of the vendor.

l. Boring: Cross ties shall be bored and adzed according to ARRC Standard Tie Boring and Adzing Plan 1.13. Adzing may be deleted if vendor will certify that ties furnished will be flat and provide a uniform bearing surface for the tie plates.

m. Anti-splitting Devices: Hardwood cross ties shall have steel multi-nail anti-splitting end plates according to AREA/AREMA Manual of Railway Engineering, Chapter 3, Section 1.8 titled "Ties and Wood Preservation", Section 1.9.2.3 titled "Nail Plates", and Section 1.10.3 titled "Nail Plates".

n. Species: Acceptable hardwood species are Red Oak, White Oak, Hickory, Black Walnut, Gum, Beech, Ash, White Heart Sycamore, Hackberry and Hard Maple.

617-3.01 CONSTRUCTION REQUIREMENTS.

Under item 1. General, delete item b and replace with the following: Remove the track from service only at times authorized by the Engineer. Restore the track to service within the time period specified.

Under item 1. General, delete item c and d in their entirety.

Delete item 4, Railroad Crossing and replace with the following: Confine work to the limits of each crossing. Railroad crossing construction consists of removing the existing crossing and furnishing and installing materials as shown on the Plans and as specified. Furnish and install detours as required.

Coordinate crossing construction through the Engineer.

Huckbolt the rail joints after final surfacing.

Install the Railroad crossing pads according to the manufacturer's recommendations.

Add the following:

5. Railroad Subballast. Stockpiling of ballast will only be allowed over firm stable base areas. In order to minimize segregation, ballast shall be stockpiled in more or less horizontal layers with no dumping over the sides of the stockpile allowed. Travel of construction machinery and other vehicles over the top of the stockpile shall be kept to a minimum. Ballast dumped on subgrade before track or turnout construction shall be kept free from material tracked in by construction equipment. Ballast dumped on skeleton track and turnouts shall be distributed uniformly during the dumping operation to minimize the carrying or regulating required to provide the designed ballast section.

   Ballast shall be kept clean and free from segregation during handling and placing operations. Contractor shall submit his plan for handling and placing ballast. This plan shall include source, type of equipment to be used, location of stockpiles, and method of distribution.

   a. Initial Railroad Subballast. ***delete***Distribute an initial layer or layers of ballast uniformly over the finished sub-ballast and compact

before placing ties. Limit the initial layer of ballast to a total compacted depth of at least 2 inches below final grade of the track. Contractor shall repair subgrade fouled or disturbed by Contractor's operations at no additional cost to State. **Subballast shall be compacted to at least 95% of maximum dry density.**

1) Each lift of ballast within the initial layers shall be uniformly spread and compacted with not less than two passes of a vibratory compactor with the following characteristics:

Gross weight	5000 lbs. minimum
Drum width	57 in. minimum
Drum diameter	40 in. minimum

Each compacted lift within the initial layers shall not exceed a depth of 4 inches.

2) The vibratory compactor shall have a weight of not less than 5000 lbs. and shall be capable of applying a dynamic load of not less than 18,000 lbs. at a frequency between 1,100 to 2,000 vibrations per minute. The compacting equipment selected by Contractor shall be subject to inspection and acceptance by Engineer.

b. Surface of the track. Ballast placed between the limits shown on the Plans shall be placed with equipment that will not damage the cross ties or the spiking and anchoring holding capacity.

1) Vibratory squeeze-type tampers shall be used to compact ballast after final vertical track alignment has been achieved. Tools shall be maintained to manufacturer's specifications. Ballast shall be packed tightly under and around the tie from a point 18 inches inside each rail on both sides of the tie to the ends of the tie. Ballast around the center of the tie between the above limits shall not be compacted.

2) Contractor shall prepare for Engineer's review and approval a detailed tamping procedure specification covering tamping equipment methods. The specification shall include a complete description of equipment to be used and variables that can be adjusted such as:

a) Number of insertions of tamping tools per tie.
b) Number of passes of tamping machine.
c) Depth of penetration.

After tamping is complete, ballast shall be regulated to the design ballast section and ballast removed from the top of cross ties, tie plates and base of rail. Contractor shall prepare for the Engineer's review and approval a detailed raising, aligning, tamping and regulating procedure.

6. Trackwork. Track construction shall be performed according to the ARRC Standards, AREA/AREMA Manual for Railway Engineering and as specified in this document. Scope of construction includes but is not limited to, unloading and distribution of track material, distribution and spacing of cross ties, laying, bolting

and spiking rail, field welding of joint rail, placing rail anchors, raising, aligning and tamping track, and shaping ballast to the design section.
Construction procedures and methods shall be employed that keep the railroad sub-ballast and ballast sections from becoming rutted or disturbed and operations that causes damage shall be stopped immediately. Alternate construction methods shall be instituted.

Existing track material removed will become the property of the Contractor. These materials shall be removed from the ***delete*** **project**.

a. Track alignment and geometry. The track shall be constructed to the alignment and profile indicated, or as adjusted by Engineer, within the tolerances specified. Contractor shall designate right or left rail, while facing in the direction of increasing stationing, to control the grade of tangent tracks on a contract-wide basis. Low rail on curves shall be the profile grade rail. High rail on curves shall be the line rail.

b. Tolerances. Deviations from indicated gauge, cross level, horizontal line, profile grade, and tie spacing shall conform to the following requirements:

1) Gage: Shall be 4'-8 ½" plus or minus 1/8".

2) Cross Level and Superelevation: Shall be plus or minus 1/8" from level on tangent or design superelevation on curve.

3) Deviation from Horizontal Alignment: Plus or minus ¼" in a 62' chord. Plus or minus ½" total except in road crossings where total deviation shall be plus or minus ¼".

4) Deviation from Profile Grade: Shall not exceed plus or minus ¼" in 62' chord or a total of plus or minus ½".

5) Tie Spacing: Distance between centerline on adjacent ties shall be 19 ½" and not vary more than plus or minus 1" from the indicated spacing, with the additional requirements that 48 ties shall be installed per 78' of track.

c. Cross tie distribution. Contractor shall receive cross ties from supplier and transport them to the work area according to the AREA/AREMA "Handling of Ties from the Tree into the Track". Ties shall be placed on a smooth, compacted surface as specified herein, spaced as shown within specified tolerances, and laid normal to the centerline of track with heartwood face down. Line ends of ties in trackage shall be aligned uniformly on the right side of track when facing increased stationing.

d. Tie plates and screws. Tie plates shall be attached to the cross ties with line and hold-down screws to the indicated patterns. Contractor may pre-

plate cross ties before distribution. If Contractor chooses to pre-plate the cross ties, s/he shall furnish additional materials required at no added cost to Owner. Contractor shall use a jig to compensate for fabrication tolerances to achieve track gage tolerances.

e. Rail Laying. Standard carbon rail shall be used on tangent track and curves up to four degrees. High strength rail shall be used on curved track over four degrees and through the crossings. Rail shall be laid according to the details and procedures that follow:

1) Rail Distribution: Rails shall be distributed along the roadbed with the head of the rail up and in such a manner and using equipment that will prevent damage to them. Dropping rails from the sides of railcars or trucks will not be permitted.

2) Rail Laying: The base of the rail and surface of the tie and tie plate shall be cleaned before laying. Rails shall be laid one at a time without bumping or striking. Rail ends shall be brought squarely together against the expansion shims and completely bolted before spiking. Rails shall be laid so that the joints in opposite rails are staggered not less than 20 feet apart, plus or minus 24 inches, except closer joints may be required at turnouts or roadway crossings. Rails of less than standard length shall be used to space the joints on curves. Rails shorter than 15 feet shall not be used. Rail shall be laid or welded so that no joints are in grade crossings.

3) Rail Cutting and Drilling: Rails shall be cut square and clean by means of rail saws. Holes for complete bolting of cut rail shall be precisely marked, center punched and drilled using an exact template for alignment. In no instance shall marking through, or drilling through joint bars be allowed. Holes shall be deburred. New holes shall not be drilled between two holes already drilled. Burning or cutting of rails or bolt holes by means of an acetylene torch will not be permitted. Cut rail ends shall be beveled at the head and be hardened to conform to AREA/AREMA "Manual Specifications for Steel Rails", Supplementary Requirement S1.

4) Rail Joints: The fishing surface of the rails and joint-bars shall be wire-brushed to remove rust before assembly. Allowance for rail expansion shall be made at joints by the use of expansion shims placed between the ends of adjacent rails. The proper expansion allowance shall be determined by the use of the following table refer to AREMA chapter 5, paragraph 5.3.1 for shim thickness to use for 39' rail.

Rail Temperature °F	Shim Thickness in mm (") For 78'- 80' rail

Below 35	5/16
35-47	1/4
48-60	3/16
61-73	1/8
74-85	1/16
Over 85	None

For shorter lengths of rail, proportionate shim thickness' shall be used. The temperature of the rails shall be determined by the use of an AREA standard rail thermometer, placed on the base of the rails close to the web on the side shaded from the sun. Sufficient time shall be allowed to accurately record the temperature. Care shall be taken to assure that shims are not squeezed or damaged during installation of shims or rails. Shims shall be removed from between rail ends as soon as the bolts have been tightened and the rail anchors applied. Track bolts shall be installed when the rail is laid and tightened before spiking.

Final bolt tension shall be between 20,000 and 30,000 lbs. Bolts shall be tightened once, at the time of rail installation. Final tension shall be checked and adjusted as necessary just before final acceptance according to AREMA chapter 5, paragraph 5.5.2.

617-5.01 BASIS OF PAYMENT. Add the following: All work including but not limited to demolition, excavation, modular concrete pads, ballast, asphalt concrete, railroad ties, rail, 18" CMP utility conduit, and perforated CMP within the limits shown on the drawings will be subsidiary to 617(1), Railroad Crossing. No separate payment will be made, except for traffic control.

(10/03/03)R268

SECTION 618

SEEDING

Special Provisions

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. Delete the last two paragraphs and add the following: Apply seed as detailed in Subsection 618-3.03 immediately after placing topsoil and shaping the slopes in accordance with Subsection 620-3.01, Placing.

618-3.02 SEEDING SEASONS. Add the following: Seeding shall be performed between May 15 and August 15.

618-3.03 APPLICATION. Add the following: Apply seed, mulch, and fertilizer as follows per acre. Apply seed and mulch in one application if using the hydraulic method.

Apply fertilizer with the hydraulic method 30 days after the seed application.

Component	Ingredients	Application Rate (per MSF)
Seed	Nugget Kentucky Bluegrass Arctared Fescue Perennial Ryegrass	0.55 lbs. 0.40 0.05 lbs. Total = 1.00 lbs
Soil Stabilizer Slope ≤ 3:1 Slope >3:1	 Mulch Mulch with tackifier	 46 lbs. 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. Add the following: The amounts of fertilizer, mulch and water for application used in this work, including any required reseeding, are subsidiary to other 618 items.

618-5.01 BASIS OF PAYMENT. Water required for the hydraulic method of application is subsidiary to seeding. (11/06/02)R52USC

SECTION 620

TOPSOIL

Special Provisions

620-3.01 PLACING. Add the following: 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.

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(1), Topsoil. (11/06/02)R53USC02

620-5.01 BASIS OF PAYMENT. Add the following after the first sentence. Stripped topsoil that is stockpiled and placed will be paid for at the Contract unit price. (ANH 12/08/04)

Add the following: No additional payment will be made for the work required to prepare topsoil. Topsoil will not be paid for until track-walking is complete.

SECTION 627

WATER SYSTEM

Special Provisions

627-1.01 DESCRIPTION. Add the following before the first paragraph: For purposes of these specifications, Water Utility shall mean the water system operated by the City of Palmer.

Add the following to the first paragraph: Construct, install, maintain and remove temporary water system. It is the intent of this contract that the Contractor shall maintain water service to all current customers in the project area during the entire period of construction activities. Install, test, flush, and disinfect water system for acceptance by the Water Utility. Provide as-builts in accordance with the conditions prescribed herein.

627-2.01 MATERIALS. Delete the section and replace with the following:

1. Water Conduit. All water mains, hydrant lines and service lines 3 inches and larger shall be Class 52 Ductile Iron Pipe with push-on joints and shall be encased in 8 mil polyethylene per Subsection 707-2.05. Pipe fittings shall be minimum 250 psi rated, mechanical joint or all bell, lined or unlined, either cast or ductile iron, conforming to AWWA C110/ANSI A21.10. Rubber gaskets joints shall conform to AWWA C111/ANSI A21.11.

   Service lines smaller than 3 inches shall be soft drawn, Type K copper.

2. Continuity Straps. No.2 AWG copper wire bonded to the pipeline with an exothermic welding process approved by the Engineer. Protect weld with a coating of asbestos-free roofing mastic, or by a protective cap approved by the Engineer.

3. Class "C" Bedding. Materials furnished by the Contractor for use as Class "C" bedding and initial backfill shall be graded within the limitations delineated below:

Sieve Size	Cumulative percent Passing by Weight
2-inch	100
1-inch	40-100
No. 4	20-75
No. 10	12-60
No. 40	2-30
No. 200	0-6

In addition to the bedding limits listed above, the fraction of material passing

the No. 200 sieve shall not be greater than 20% of that fraction passing the No. 4 sieve.

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

   Restrained joints, EBAA Iron MEGALUG or approved equal, shall be installed where the pipeline terminates, branches, changes alignment utilizing a fitting, and on hydrant lines. Install restrained joints per manufacturer's instructions. Provide manufacturer submittals for each type of thrust restraint to be used. Such submittals shall include thrust restraint calculations and other appropriate data.

5. Thrust Blocks. Concrete for thrust blocks shall be placed against undisturbed soil or Type A Select Material, that has previously been compacted to 95% maximum density. Concrete for thrust blocks shall be Class W. All pipe and fittings exposed to concrete shall be double wrapped with 4 mil polyethylene film prior to placement of the concrete.

6. Gate Valves. Gate valves shall be iron body, fully bronze mounted, double disc, parallel or resilient seat valves manufactured in accordance with AWWA C500. All valves shall be non-rising stem type with an O-ring seal and a two-inch square operating nut. Valves shall open counter-clockwise and have mechanical joint ends.

7. Valve Boxes. Valve boxes shall be cast iron of sliding, adjustable height type with round or oval bottom hood sections to fit over the top of the valve. The top section shall be recessed to receive a close fitting "eared" lid with the word "water" cast into it. Internal diameter of the smallest section shall not be less than five (5) inches. Minimum thickness of the metal shall not be less than five-sixteenth (5/16) inch. Castings shall be smooth and the workmanship shall be acceptable to the Engineer.

   Valve boxes shall be of sufficient length for the pipe cover depth on the profile drawings and in accordance with the Standard Detail of these Specifications.

8. Fire Hydrants. Fire hydrants shall conform to the requirements of ANSI/AWWA C502 for Dry Barrel Fire Hydrants. Fire hydrants shall be Mueller Centurian or equal.

   a. All fire hydrants shall be supplied with 5-1/4-inch main valve opening.

   b. All single pumper hydrants shall be furnished with a 6-inch ANSI Class 125 standard mechanical joint end with restrained joint.

c. All connections shall be restrained mechanical joints unless otherwise indicated in the Contract Documents.

d. Fire hydrants shall be single pumper, furnished with two (2) 2-1/2-inch hose connections and one (1) 4-1/2-inch pumper connection.

e. Unless otherwise required by the Contract Documents, all hydrants shall be furnished with a barrel length that will allow a minimum of 10 feet of bury.

f. The main valves shall be of the compression type, where water pressure holds the main valve closed permitting easy maintenance or repair of the entire barrel assembly from above the ground without the need of a water shut-off.

g. All fire hydrants shall be furnished with a breakaway flange which allows both barrel and stem to break clean upon impact from any angle. Traffic flange design must be such that repair and replacement can be accomplished above ground.

h. Painting and coating shall be in accordance with cited AWWA specifications. After installation, the hydrant section from the traffic flange to the top of the operating nut shall be painted "Caterpillar Yellow".

i. Operating and nozzle nuts shall be pentagon shaped with 1-1/2-inch point to flat measurements.

j. Hose nozzle threading shall be in conformance with NFPA #194 for National (America) Standard Fire Hose Coupling Screw Threads.

k. All working parts shall be bronze or noncorrosive metal in accordance with the requirements of ANSI/AWWA C502.

l. All hydrants shall be left-hand opening (counter-clockwise).

m. All hydrants shall be draining (drain plug removed).

n. Hydrant leg and barrel section shall be wrapped with 8-mil polyethylene wrap.

9. Corporation Stops. Line size, quarter turn, iron pipe thread x copper flare, Mueller H-15025 or approved equal.

10. Curb Stops. Brass, line size, quarter turn, closed bottom with drain, copper flare x copper flare, Mueller Mark II Oriseal H-15214 or approved equal.

11. Key Box. Key boxes shall be as specified on the Drawings. Key boxes shall provide a clear and unobstructed access for operation of the curb stop. Key boxes shall not be in contact with a gas main. Key boxes shall be installed in the standard location as shown on the Drawings.

12. Temporary Water System. Material used for temporary water service shall conform to the requirements of this section and shall be constructed of one or more of the following materials: polyvinyl chloride (PVC), high density polyethylene (HDPE), copper, ductile iron, cast iron, or galvanized steel. The primary water feeder pipe shall be a minimum of 3 inches diameter. All equipment used must be specifically designed and properly disinfected for the storage, handling, and delivery of potable water.

    Service shall be supplied to each structure presently served by the Water Utility. The following minimum criteria shall be used for service to each structure:

    a. 25 psi minimum, 85 psi maximum (or existing system pressure, whichever is greater) delivery pressure measured at the connection to the structure.

    b. 5 gallons per minute flow rate at the above delivery pressure measured at the connection to the structure.

    c. Potable water system and water quality shall conform to 18 AAC 80 Alaska Drinking Water Standards.

    d. All services to structures shall be valved to allow individual control of service.

CONSTRUCTION REQUIREMENTS

627-3.01 GENERAL. Delete the first paragraph and add the following:

Temporary Water System

No Water Utility customer may be without water service for more than 4 hours in any 24 hour period. A temporary water service connection shall be provided by the Contractor to provide potable water under pressure in the event of an outage longer than 4 hours. All customers shall be notified 48 hours before they are transferred on or off a temporary water system and before any other service interruption. Prior to constructing temporary water services on private property, the Contractor shall secure a written "Permission to Enter" from the property owner. Such permission shall hold the State, the Department, and the Water Utility and its agents harmless for any claims resulting from damage or harm sustained due to the Contractor's operation.

The Contractor shall submit a plan for a temporary water system for written approval by the Water Utility and the Safe Water Division of the State of Alaska Department of Environmental Conservation prior to beginning work on such a system. The plan must identify the type of system, method of construction, and the maintenance and operation procedures to be used. The plan must identify service to each existing customer except those who agree in writing to have their service temporarily disconnected. The Contractor shall obtain any such agreement. Any agreements between the Contractor and property owners regarding access and use of private property shall be submitted with the plan. The methods to be employed in maintaining water service are left to the Contractor. Surface piping, trailer mounted supply systems, and so forth may all be considered as long as they comply with current health standards and requirements.

The Contractor shall submit the name and phone number of a contact person and at least one alternate who shall be available on a 24-hour basis for repair and/or maintenance of the temporary water system. In the event that the Contractor fails to provide, repair and/or maintain the temporary water system and the Water Utility is required to provide, repairs and/or maintain the system, all costs associated with said work shall be deducted from the contract amount.

The temporary water system shall be in place and operating prior to shut-down of the existing water system. All temporary water service equipment shall be disinfected per AWWA C652, Disinfection of Water Storage Facilities, and AWWA C651, Disinfecting Water Mains. A testing laboratory certified by the State of Alaska shall do all bacteriological sample testing as required by these specifications.

All temporary service equipment shall be disinfected prior to connecting to a residence or business and shall be disinfected each and every time the equipment is moved or connected to another location.

The Engineer shall be notified 24 hours prior to the installation of any temporary water system. The Engineer shall be present to inspect the disinfection process of any temporary water system.

Fire hydrants may be used as a water source for a temporary water system. The Contractor will be required to obtain a no-charge hydrant permit from the Water Utility, and will be required to meet all permit conditions (winter use of a hydrant shall require special permission from the Water Utility). In addition, the Contractor shall provide a gate valve assembly at the fire hydrant as a shut-off valve for the temporary water system. The Contractor shall be responsible for any damage to the hydrant and temporary service piping and shall repair such damage at no cost to the Water Utility.

Permanent Water System

Prior to commencement of work to install the water system, the Contractor shall submit to the Engineer for review, 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. The plan shall be of sufficient detail to clearly indicate the proposed work sequence, schedules, and disruption of water service.

The Water Utility, through the Engineer, reserves the right to suspend the permanent 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.

If construction or excavation require the removal of any existing privately owned facilities or improvements within the provided temporary construction easements, the Contractor shall be responsible for coordinating with the owner and for reestablishing lawns, driveways, parking lots, etc., at the Contractor's cost. Any restorative work will be completed as soon as practicable after the installation, but in no case shall the period of time exceed two weeks. The contractor shall restore property disturbed by contract activity to the preconstruction condition.

Delete the second paragraph.

Add the following to the fourth 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."

Add the following after the fourth paragraph: The locations of existing sewer services are unknown, have not been shown on the drawings, and may not be field located by the Water Utility. Contractor shall take every effort to protect existing services, both located and unlocated, from damage and shall anticipate one service to each developed lot adjacent to a sewer main.

Repairs to any damaged sewer services shall be made using Class 50 DIP and Romac (or approved equal) repair couplings with stainless steel bands. Pipe inside diameter shall match the existing pipe or, if the exact match is not available, the new pipe may be slightly larger. The inverts of the new pipe shall match the inverts of the existing pipe, regardless of pipe diameter. Pipe shall be bed and backfilled in accordance with the trench detail.

Contractor shall notify the sewer service user immediately if a service is damaged and advise to user to not introduce any flow into the service until it is repaired. Contractor shall perform the repair immediately to restore service and shall advise the user when the service is usable. Contractor shall contain any flow that spills from the damaged service and shall dispose of waste and contaminated soil in accordance with DEC regulations.

Repair to any sewer services is incidental to the water pipe construction and no separate payment will be made.

Delete the fifth and sixth paragraphs and substitute the following: At least 48 hours prior to removing or disrupting service to fire hydrants, the Contractor shall contact the Palmer Fire Department, Chief Contini at 761-1312 and the Water Utility. Any hydrant taken out of service shall be immediately and securely wrapped in black plastic to indicate its status.

The Contractor shall notify the Water Utility, Greg Wickham at 863-0742, 72 hours prior to an interruption of their water service. Additionally, the Contractor shall notify all affected property owners and the Engineer, 48 hours prior to interruption of the Water Utility's water service. The Contractor shall provide temporary service to all those property owners with disrupted water service if the interruption exceeds 4 hours duration.

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.

Delete the eighth paragraph and substitute the following: In addition to restrained joints, poured-in-place concrete thrust blocks with the minimum base area as shown in the Drawings shall be installed where pipeline terminates, branches or changes alignment utilizing a fitting.

Delete the tenth and eleventh paragraphs and substitute the following: Where new water mains cross existing sanitary sewer or storm drain pipes, new water main shall be installed a minimum of 18 inches vertically from the sanitary sewer or storm drain pipe. Water pipe joints shall be a minimum of 9 feet horizontally from sanitary sewer pipes, storm drain pipes, or manholes.

Where the required clearance cannot be obtained, the existing pipe is to be encased with a jacket of Class A concrete, 3 inches thick for 10 feet on each side of the crossing. Alternately, the existing pipe may be replaced with Class 52 DIP with joints spaced at least 9 feet from the crossing.

Add the following:

Trench Excavation and Backfill

Excavation and backfill shall be to the width and depth as shown on the drawings. Trench width at or below the top of the pipe shall be of a width that will allow compaction equipment to be utilized at the sides of the pipe.

Contractor shall erect and maintain barricades to prevent access around all excavations left open at the end of the workday. Contractor shall provide and maintain adequate barricades to ensure public safety at all times during the prosecution of the Work.

Contractor shall perform all excavation of every material encountered. Excavated material shall be placed in an orderly manner and at a distance from the trench conforming to all State and/or Federal safety codes. Excavated material meeting the requirements of Select Material shall be stockpiled separately and reused in the Work.

Not more than 200 feet of trench shall be open in advance of the pipe installation unless authorization, in writing, is obtained from the Engineer. Not more than 100 feet of trench shall be left open at the end of the workday, unless otherwise approved by the Engineer.

All bedding material and backfill material shall be placed in uniform layers of not more than 12 inches in depth and compacted in accordance with Subsection 203-3.04. In no case shall bedding material be placed above the springline of the pipe in a single lift. Ponding or jetting of backfill will not be permitted unless approved in writing.

When existing conduits or utilities, which are not scheduled for removal or abandonment, are encountered in the excavation, they shall be adequately supported and protected from damage.

All sheeting and bracing used in excavation shall be removed by the Contractor following the completion of the work.

Abandon Existing Pipe

Existing pipe shown to be abandoned shall be abandoned-in-place as an incidental item of construction. Pipe abandoned-in-place shall have the ends capped. In those areas that the presence of existing pipe causes a conflict with new or existing utilities or facilities, the pipe may be removed as an incidental item of construction. All abandoned materials removed and not reused shall become the property of the Contractor, unless specifically addressed otherwise in these special provisions.

Remove Existing Pipe

Pipe, hydrants, and appurtenances called out on the plans to be removed shall be an incidental item of construction. All removed materials shall become the property of the Contractor, unless specifically addressed otherwise in these special provisions.

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.

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. Delete the first and second paragraphs and substitute the following: Installation shall be in accordance with these specifications and AWWA C600. The interior of the conduit and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench. The conduit shall be kept clean during laying operations by plugging. Lay conduit to the grades and lines shown on the Plans. However, at a sufficient distance prior to encountering a known obstacle or tying into an existing conduit, the Contractor shall expose and verify the exact location of the obstacle or conduit so proper alignment and/or grade may be determined before the conduit 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 seventh and eighth paragraphs and substitute the following: Deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets shall not exceed 60 percent of the manufacturer's recommended maximum deflection. If the alignment requires deflection in excess of the above limitations, the Contractor shall furnish special bends to provide angular deflections within the limits allowable. Wherever possible, the Contractor shall achieve the desired deflection by taking advantage of reduced deflections over multiple joints. Short-radius curves and closures shall be formed by shorter lengths of conduit, bevels, or fabricated specials.

Conduit shall be so laid in the trench that after the line is completed, the bottom of the conduit conforms accurately to the grades and alignment shown on the Plans. A maximum 0.2-foot deviation from design alignment and elevation will be allowed. Both line and grade shall be checked and recorded in a field book for each piece of conduit and appurtenance installed. All adjustments to line and grade shall be done by scraping away or filling the earth under the body of the conduit and not by blocking or wedging up.

The Contractor shall have survey instruments such as transit and level for transferring alignment and grades from offset hubs. He 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.

A minimum of 10-foot horizontal separation shall be maintained between water and sanitary sewer mains and services, or water and storm drains. Locations having less than 10-foot minimum separation require an ADEC waiver.

A minimum vertical separation of 18 inches shall be maintained at water and sewer or water and storm drain crossings. Where a storm drain and water main cross with less than 3-feet vertical separation (outside of conduit to outside of conduit), insulate the water main with 4-inch thick rigid insulation board (Rmin=4.5 per inch).

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. No conduit length less than 8 feet shall be incorporated into the system except those necessary for fire hydrants or valve locations.

The Contractor has the option of using either mechanical or push-on joints for conduit installed in trenches, except in those areas where restrained joints are required. All joints shall conform to the requirements of AWWA C600.

The Contractor will be required to use restrained joints on all fire hydrant leads. The Engineer may check any or all restrained joints to assure proper torque as specified by the manufacturer.

Two electrical continuity straps shall be installed on each side joint for conduits 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.

Polyethylene Encasement

The outside of all ductile iron and cast iron conduit and fittings used in water system construction shall be encased with one layer of 8 mil thick polyethylene film. Valves and other appurtenances used in water system construction shall be encased with two layers of 4 mil thick polyethylene film. The polyethylene encasement material for conduit shall conform to AWWA C105/ANSI A21.5. The polyethylene encasement shall be installed in strict conformance to the methods described in AWWA C105/ANSI A21.5 and the Ductile Iron Pipe Research Association's "A Guide for the Installation Of Ductile Iron Pipe."

Thrust Restraint

Restrained joints, of the type specified herein, and thrust blocks, shall be installed where the conduit line changes alignment utilizing a tee, cross, bend, or similar fitting and at conduit ends.

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

Service Taps

All service taps for services 2 inches and smaller shall be installed under system pressure with the main in service prior to making the taps.

Live-tap Connections
Contractor shall provide all trench excavation, backfill, and compaction necessary for the live tap connections. Excavation for live tap connections shall be subsidiary and Contractor shall excavate substances encountered to the depth required for the live tap connections. Variations from the depth indicated in the plans will not be grounds for additional compensation. It shall be Contractor's responsibility to familiarize himself with the depth of water mains for the project. Contractor shall excavate for live tap connections in such a manner that the excavation is 90° to the main water line, whenever possible. The trench shall be long enough and of sufficient width at the bottom to allow installation of the valve for the live tap connection and provide for safety.

Contractor shall be responsible for, and shall bear the expenses incurred, if a water main should be damaged during excavation or backfilling.

Contractor shall provide equipment, labor, materials, and supplies (except the water main line valve) necessary to complete the live tap connection. Contractor shall notify the Engineer and Water Utility 48 hours (two working days) prior to installation of the live tap connection.

Tie back rods and/or tie back rod and shackle assemblies will not be acceptable as restrained joints or restraining system for valves and valve/pipe joint interface.

Unless otherwise detailed on the plans, valve and valve/pipe interface shall be push-on rubber gasket type conforming to AWWA C111. Where specified on the plans, restrained joint pipe shall be EBAA Iron MEGALUG, or approved equal.

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

The Work under this section consists of the performance of all Work required for Fire Hydrant Installation, including furnishing and installation of single pumper fire hydrant, conduit between the hydrant and the main, auxiliary gate valve, valve box, steam thaw piping, thrust restraint, guardposts, and Polyethylene wrap, at locations shown on the Plans.

Auxiliary Gate Valve and Valve Box
Auxiliary gate valves and valve boxes shall be furnished and installed in accordance with 627-2.01 and 627-3.05.

Leg Thaw Pipe
The leg thaw pipe shall be installed on the left hand side of the hydrant and fabricated into an "L" shape. The vertical portion shall be 6 inches to the side and 3 inches to the rear of the traffic flange extending 15 inches above finished grade with no perforations. The horizontal portion shall be 6 inches above and 6 inches to the side of the hydrant leg and shall be perforated with 1/8 inch diameter holes, spaced 1 foot apart facing the center of the hydrant leg.

Barrel Thaw Pipe
The barrel thaw pipe shall be installed on the right hand side of the hydrant from 6 inches above the hydrant leg and extending 15 inches above finished grade, and installed vertically 3 inches to the rear and 6 inches to the side of the traffic flange. The barrel thaw pipe shall be perforated with 1/8 inch diameter holes spaced 1 foot apart starting 18 inches below finished grade and facing the hydrant barrel. A ¼ inch machine screw shall be installed 1 inch below the cap to provide identification of the barrel thaw pipe.

Joint Restraint
All joints shall be restrained in accordance with 627-2.01.

Guard Posts
Install guard posts at each hydrant installation as shown on the plans.

Contractor shall make final adjustments to the traffic flange.

Hydrants installed but not available for use shall be covered with burlap and securely tied.

Hydrant legs shall be installed level and barrels installed plumb.

Contractor shall paint or use permanent-ink marker to stencil 2-inch black letters on the hydrant bonnet indicating the direction and distance to the auxiliary valve box, to the nearest 0.1 foot.

Where hydrants are removed, the entire hydrant assembly from the main to the hydrant shall be removed and, where the main is to be abandoned in place, the tee is to be capped watertight.

627-3.04 VALVES. Delete this subsection and substitute the following: Valves shall be installed where shown on the plans. Valves shall be installed plumb. 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 VALVE BOXES. Delete this subsection 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 shall be as shown on the Plans.

Top of base section shall be approximately on line with nut at top of valve stem, and the entire assembly shall be plumb. Provisions shall be made to restrict the soils from entering the bottom section of the valve box. Wrap burlap inside bottom

section under the packing gland and wrap 3 layers of non-woven geotextile fabric around the outside of the valve and base section of the valve box and secure the fabric at the top and bottom with wire or tape.

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 this subsection 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 canceled.

Contractor shall submit a request to supply water for flushing, testing and disinfecting in writing to the Engineer at least 24 hours prior to obtaining Water Utility supplied water. The request for water will be subject to water availability and meeting the Contractor's schedule may not be possible.

The Water Utility reserves the right to provide a test gauge or to check and test the Contractor's test gauge at any time.

Flushing

All flushing shall be coordinated with the Water Utility. All newly laid water conduit shall be "open-bore" flushed to remove any foreign matter to the satisfaction of the Water Utility. A detailed plan for cleaning of the lines shall be submitted to the Engineer for review and approval prior to commencement of work.

"Open-bore" flushing shall be accomplished prior to hydrostatic testing and disinfection at all extremities including all stubouts and dead-ends. The Contractor shall furnish, install and remove all fittings and conduit necessary to perform the flushing. Under no circumstances will "open-bore" flushing through hydrants or reduced outlets be permitted.

Flushing of newly installed conduit may be required to occur between the hours of 1:00 AM and 6:00 AM, depending on availability of water, as authorized by the Water Utility. Flushing shall be considered incidental to this work and no separate payment will be made.

Hydrostatic Testing

A hydrostatic test shall be conducted on all newly constructed water conduit, service lines, fire hydrant leads and stub-outs after "open-bore" flushing in the presence of the Engineer and the Water Utility in accordance with the requirements of AWWA C600 unless hereinafter modified. The Contractor, at his option, may either use a pressure test or a leakage test.

The Contractor shall furnish all necessary assistance, equipment, labor, materials and supplies (including the test pressure gauge) necessary to complete the test to the satisfaction of the Water Utility. The Contractor shall suitably valve off or plug the outlet to the existing or previously-tested water main at his expense, prior to making the required hydrostatic test.

Prior to testing, all air shall be expelled from the conduit. If permanent air vents are not located at all high points, the Contractor shall, at his expense, install corporation cocks at such points so the air can be expelled as the conduit is slowly filled with water.

Where any section is provided with poured-in-place concrete thrust blocks for fittings or hydrants, the hydrostatic test shall not be made until at least seven days after installation of the thrust blocks unless otherwise approved by the Engineer.

No hydrostatic test section shall exceed 1,000 feet unless approved by the Water Utility in writing. All main line valves, fire hydrant auxiliary valves, fire hydrant main valves and plugs shall be tested. All intermediate valves within the section being tested will be fully closed and reopened as directed by the Engineer during the actual test. Only static pressure will be allowed on the opposite side of the end valves of the section being tested.

All hydrostatic testing will be performed through test copper. Use of fire hydrants and service connections for testing will not be allowed.

The hydrostatic pressure shall be 150 psi and the duration of each hydrostatic pressure test shall be 30 minutes. After the required test pressure has been reached, the pumping will be terminated. If the pressure remains constant for 30 minutes without the aid of a pump, that section of the conduit will not be subjected to any further hydrostatic tests.

If a hydrostatic pressure test fails on any section, the Contractor has the option to perform a leakage test on that section. The Contractor will furnish the test gauge and measuring device, and the Contractor shall furnish all other necessary assistance, equipment, labor, material and supplies to conduct the test.

Leakage for a newly-installed conduit is determined by the following formula:

$$L=\frac{ND(P)^{.05}}{7400}$$

where: L = Allowable leakage in gallons per hour
N = Summation of mechanical and push-on joints in length of pipe tested
D = Diameter of conduit in inches
P= Test pressure in pounds per square inch

The duration of each leakage test shall be 2 hours and during the test, the conduit

shall be subjected to the constant test pressure as defined above. The test pump shall be valved to ensure that constant test pressure is maintained throughout the test and all excess water will be returned to a storage tank. If the pressure decreases below the required test pressure during the 2-hour period, the preceding portion of that test shall be declared void.

Cracked or defective conduit, gaskets, mechanical joints, fittings, valves or hydrants discovered as a consequence of the hydrostatic tests shall be removed and replaced with sound material at the Contractor's expense. The test shall then be repeated until the results are satisfactory.

In the instance where connection is made to an existing water conduit, a new valve shall be installed on the connection. The Contractor shall suitably seal off the outlet leading to the existing conduit prior to making the field tests.

Continuity Tests

The Contractor shall perform electrical conductivity tests on all mains less than 12 inches in diameter in the presence of the Engineer and the Water Utility. The Contractor shall maintain a circuit of 600 amperes DC current for a period of 15 minutes. Return current shall be at least 90 percent of the input current. All equipment necessary to maintain the circuit shall be supplied by the Contractor.

All continuity tests will be through wires brought to the surface or through ¾-inch minimum copper pipe connected to the main. The use of fire hydrants and valves, as substitutes for wires will not be accepted. All wires brought to the surface to complete the continuity test shall be removed to a depth of two feet below finished street grade upon completion of the tests.

Removal of Test and Air Vent Copper Pipe

After completion of testing, all test and air vent copper pipe shall be removed and the stop closed at the main, in the presence of the Engineer and Water Utility.

627-3.07 DISINFECTION OF WATER LINES. Delete this subsection and substitute the following: All portions of the water system shall be disinfected, 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 after completion of pressure and/or leakage tests in compliance with AWWA C651, Disinfecting Water Mains.

Chlorine shall be used for disinfection, and shall be applied only by one of the following methods:

1. liquid chlorine gas and water mixture
2. direct chlorine gas feed
3. calcium hypochlorite and water mixture

Calcium hypochlorite shall be comparable to commercial products known as HTH,

Perchloren or Machochlor. The chlorinating agent shall be applied at the beginning of the section adjacent to the feeder connection, insuring treatment of the entire line. Water shall be fed slowly into the new conduit with chlorine applied in amounts to produce a dosage of 40 to 50 ppm. Application of the chlorine solution shall continue until the required dosage is evident at all extremities of the newly-laid conduit.

Chlorine gas-water mixture shall be applied by means of a solution-feed chlorinating device. Chlorine gas shall be fed directly from a chlorine cylinder equipped with a suitable device for regulating the rate of flow and effective diffusion of gas within the conduit. Calcium hypochlorite shall be injected or pumped into the water conduit. During the chlorination process, all intermediate valves and accessories shall be manipulated so that the strong chlorine solution in the conduit being treated will not flow back into the conduit supplying the water. Hydrostatic testing of water conduit containing the chlorine mixture will not be allowed.

A residual of not less than 5 ppm chlorine shall be produced in all parts of the water conduit and retained for a minimum period of 24 hours, after which it shall be flushed from the conduit at its extremities until the replacement water tests are equal chemically and bacteriologically to those of the permanent source of supply. In no instance will a water conduit be chlorinated before "open-bore" flushing.

CHLORINATION

Conduit Diameter	Dosage (oz. per 100 feet)
6 in	1.35 oz.
8 in	2.75 oz.
10 in	4.30 oz.
12 in	6.19 oz.
16 in	11.00 oz.

The above table is to be used as a guide for chlorinating mains by the calcium hypochlorite and water mixture method. The given dosage per 100 feet results in a chlorine solution of 40 to 50 ppm. This dosage takes into account that Contractors most frequently use granular HTH, which is 65 percent pure. If another chlorinating agent is used, the dosage must be adjusted. Caution should be exercised against producing too high a concentration of chlorine in the conduit.

After completion of all testing, all test and air vent copper pipe shall be removed and the corporation cock closed at the main in the presence of the Engineer and the Water Utility.

Add the following subsection:

627-3.08 AS-BUILT PLANS AND WORKING DRAWINGS. 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. Conduit and appurtenances shall be referenced by stationing, showing design line and grade, and as-built line and grade.

When the 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 this subsection and substitute the following:

1. Water Conduit. Measurement for water conduit with appurtenances will be per linear foot of horizontal distance of the various sizes and classes furnished and installed as set forth in the Bid Schedule. Measurement will be from station to station as staked in the field and as shown on the plans. No deduction in length will be made for valves and fittings.

2. Fire Hydrant Installation. Measurement will be the number of fire hydrant assemblies installed, including excavation, backfill, Select A backfill, and removal of existing hydrants.

3. Water Service Connection. The quantity to be paid will be the actual number of water services installed from the new main to the new key box including connection to the existing service.

4. Gate Valves and Valve Boxes. The quantity to be paid will be the actual number of valves, including valve boxes and marker posts, of each class and size furnished, installed, and accepted.

627-5.01 BASIS OF PAYMENT. Delete the first through fifth paragraphs and substitute the following:

All labor, tools, equipment, fittings, pipe, and demolition necessary to connect new water main to the existing water mains as shown on the drawings, is subsidiary.

The contract price for Water Conduit includes trench excavation, bedding, backfill, Select A backfill, disposal of surplus excavated material, pipe, fittings, tees, reducers, crosses, bends, polyethylene encasement, couplings, thrust blocks, testing, disinfection, connection to existing mains, abandonment or removal of the existing

conduit, etc.

The contract price for Fire Hydrant Installation includes trench excavation, bedding, backfill, disposal of surplus excavated material, fire hydrant, tee in main, auxiliary gate valve with valve box, conduit between the main and the hydrant, all fittings and materials required, , testing, disinfection, painting, removal of existing hydrants and associated piping, valves and appurtenances.

The contract price for Water Service Connection includes trench excavation, backfill, disposal of surplus excavated material, valves, key box, lengthening or shortening private side of service, and removal of the existing service pipe and valves.

Repair of existing improvements on private property and repair of existing utilities damaged by the Contractor will not be paid for directly but will be considered subsidiary.

Add the following pay items:

Pay Item	**Pay Unit**
627 (8-1) Water Service Connection, 1-inch	Each
627 (8-2) Water Service Connection, 2-inch	Each

SECTION 635

INSULATION BOARD

Special Provisions

635-4.01 METHOD OF MEASUREMENT. Delete this Subsection in its entirety and substitute the following: By the square foot of insulation board, in place based on the nominal dimensions or the materials, or by the square foot of insulation board with the required "R" value in its final position, including transitions, regardless of thickness, complete and accepted.

Sand blanket material is subsidiary. (08/23/00)R57M98USC

635-5.01 BASIS OF PAYMENT. Add the following pay item:

Pay Item	Pay Unit
635(2) Insulation Board, R = 18	Square Foot

Delete this Section in its entirety and substitute 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. add the following to the end of the last sentence: BMP: Add " , most recent revisions."

Item 2 Note which appendix ESCP is in.

Item 5. after "EPA Form 3510-9 add the following: ", most recent revisions." Add the following: "eNOI. Electronic notice of intent to begin ground disturbing activities under the NPDES General Permit."

Item 6 Change EPA Form number to 3510-13.

Replace the last sentence of item 9. with the following: The approved SWPPP must contain a copy of the Contractor's signed NOI.

Replace subsection 641-1.03 with the following:

641-1.03 SUBMITTALS. For projects that disturb one acre or more of ground submit three copies each of the SWPPP and HMCP to the Engineer for approval. Submit one 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 five calendar days before the preconstruction conference.

The Department will review the SWPPP and HMCP submittals within 14 calendar days. Submittals will be returned to the Contractor as either requiring modification or having been 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 the Contractor submits the Contractor's original NOI to EPA. NOIs can be submitted by Certified Mail or through the EPA's electronic NOI system (eNOI).. 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 Ctr
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

For Overnight/Express mail delivery:

EPA Storm Water Notice Processing Ctr
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.

Delete paragraphs 3 and 4 and add the following: The Contractor shall not begin ground disturbing activities until the Engineer has issued the Contractor 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's and Department's NOIs. The Department will transmit the Department's NOI to the EPA."

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.

Delete paragraph 6, and substitute the following: "When the Contractor receives written notice from the Department that the project is stabilized, submit signed NOT 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. Add following to the end of the third sentence: "most recent revisions.", for projects disturbing 5 acres or more.

Replace subsection 641-3.01 with the following:

641-3.01 CONSTRUCTION REQUIREMENTS. Do not begin ground disturbing work until **receiving** written notification from the Engineer that the EPA has acknowledged receipt of the Contractor's NOI and the department's NOI, and has listed them as active status. The EPA will post the status of the NOIs on the EPA website.and DEC

Post at the construction site:

1. NPDES Permit number, if available, and a copy of the NOI,
2. Name and phone number of the local contact person, and
3. Location of a SWPPP available for viewing by the public.

Comply with requirements of the approved HMCP, the submitted SPCC Plan, and state and federal regulations that pertain to the handling, storage, cleanup, and disposal of petroleum products or other hazardous substances. Contain, clean up, and dispose of discharges of petroleum products and/or other materials hazardous to the land, air, water, and organic life forms. Perform all fueling operations in a safe and environmentally responsible manner. Comply with the requirements of 18 AAC 75 and AS 46, Oil and Hazardous Substances Pollution Control. Report oil spills as required by federal, state and local law, and as described in the SPCC Plan.

Comply with requirements of the NPDES General Permit, implement temporary and permanent erosion and sediment control measures identified in the SWPPP, and ensure that the SWPPP remains current. Maintain temporary and permanent erosion and sediment control measures in effective operating condition.

Perform inspections and prepare inspection reports in compliance with the project SWPPP and the NPDES General Permit.

1. Joint Inspections. Before start of construction, conduct a joint on site inspection with the Engineer and the Contractor's field representative to discuss the implementation of the SWPPP.

   Conduct the following additional joint on site inspections with the Engineer:

   a. During construction, inspect the following at least once every seven days and within 24 hours of the end of a storm exceeding 1/2 inch in 24 hours (as recorded at or near the project site):
      (1) Disturbed areas that have not been finally stabilized.
      (2) Areas used for storage of erodible materials that are exposed to precipitation.
      (3) Sediment and erosion control measures.
      (4) Locations where vehicles enter or exit the site.

   b. Prior to winter shutdown, to ensure that the site has been adequately stabilized and devices are functional.

   c. At project completion, to ensure final stabilization of the project.

2. Winter Inspections. During winter shutdown, conduct inspections at least once every month and within 24 hours of a storm resulting in rainfall of 1/2 inch or greater. The Engineer may waive monthly inspection requirements until one month before thawing conditions are expected to result in a discharge, if all of the following requirements are met:
   a. Below freezing conditions are anticipated to continue for more than one month.
   b. Land disturbance activities have been suspended.
   c. The beginning and ending dates of the waiver period are documented in the SWPPP.

3. Inspection Reports. Prepare and submit, within three working days of each inspection, a report on state Form 25D-100, with the following information:
   a. A summary of the scope of the inspection.
   b. Name(s) of personnel making the inspection.
   c. The date of the inspection.
   d. Observations relating to the implementation of the SWPPP.
   e. Any actions taken as the result of the inspection.
   f. Incidents of noncompliance.

   Where a report does not identify any incidents of noncompliance, certify that the facility complies with the SWPPP and NPDES General Permit. The Contractor and the Engineer will sign the report according to the Standard Permit Conditions of the NPDES General Permit, Part 8, Appendix G. Include reports as an appendix to the SWPPP.

Retain copies of the SWPPP and all other records required by the NPDES General Permit, for at least three years from the date of final stabilization.
If unanticipated or emergency conditions threaten water quality, take immediate suitable action to preclude erosion and pollution.

Submit amendments to the SWPPP to correct problems identified because of:
1. Storm or other circumstance that threatens water quality, and
2. Inspection that identifies existing or potential problems.

Submit SWPPP amendments to the Engineer within seven days following the storm or inspection. Detail additional emergency measures required and taken, to include additional or modified measures. If modifications to existing measures are necessary, complete implementation within seven days.

Stabilize areas disturbed after the seeding deadline within seven days of the temporary or permanent cessation of ground disturbing activities.

Submit a signed NOT to EPA and a copy to the Engineer:

1. Upon receipt of written notification from the Engineer 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.

If the Contractor fails to coordinate temporary or permanent stabilization measures with the earthwork operations in a manner to effectively control erosion and prevent

water pollution, the Engineer may suspend earthwork operations and withhold monies due on current estimates for such earthwork items until all aspects of the work are coordinated in a satisfactory manner.

If the Contractor fails to:

1. Pursue work required by the approved SWPPP,
2. Respond to inspection recommendations and/or deficiencies in the SWPPP,

or

3. Implement erosion and sedimentation controls identified by the Engineer,

the Engineer may, after giving written notice, proceed to perform such work and deduct the cost thereof, including project engineering costs, from progress payments.

Replace subsection 641-5.01 with the following:

641-5.01 BASIS OF PAYMENT.

1. Item 641(1) Erosion and Pollution Control Administration. At the contract lump sum price for administration of work under this Section. Includes, but is not limited to, plan preparation, plan amendments and updates, inspections, monitoring, reporting, and record keeping.

2. Item 641(3) Temporary Erosion and Pollution Control. At the prices specified in the contract to install and maintain temporary erosion, sedimentation, and pollution control measures.

3. Item 641(4) Temporary Erosion and Pollution Control Amendments. At the prices specified in the directive for extra, additional, or unanticipated work to install and maintain temporary erosion, sedimentation, and pollution control measures. Work paid under this item will be shown as amendments to the original approved SWPPP or HMCP.

Temporary erosion and pollution control measures that are required at Contractor furnished sites are subsidiary.

Perform temporary erosion and pollution control measures that are required due to negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or ordered by the Engineer, or for the Contractor's convenience, at the Contractor's expense.

Permanent erosion and pollution control measures will be measured and paid for under other contract items, when shown on the bid schedule.

Payment will be made under:

Pay Item	Pay Unit
641(1) Erosion and Pollution Control Administration	Lump Sum
641(3) Temporary Erosion and Pollution Control	Lump Sum
641(4) Temporary Erosion and Pollution Control Amendments	Contingent Sum

R272USC05(07/05/05)

SECTION 642

CONSTRUCTION SURVEYING AND MONUMENTS

Special Provisions

642-1.02 DEFINITIONS: Add the following definition:

6. Closed Traverse: A survey traverse which starts and ends upon Department provided control whose relative positions have been determined by other surveys of equal or higher order of accuracy. Monuments re-established from original references will be considered Department provided control. A closed traverse will require multiple angles and distances to and from each station.

642-3.01 GENERAL: Add the following sentence to the paragraph that starts, "When the Department has not established...": Without prior written approval of the Survey Manager for the Region in which the project is located, the use of GPS is not an acceptable method for directly establishing project centerline monuments or the direct re-establishing of any missing Department provided control points.

642-3.02 CROSS SECTION SURVEYS: Delete the text of item 13 and replace with the following: Submit the survey field notes and completed Monument of record forms for the specific area, relating to monument referencing, before beginning clearing, grubbing, or excavation.

642-3.03 MONUMENTS: Delete the first and second paragraph and the first sentence of the third paragraph and replace with the following: Install primary and secondary monuments, as called for in the Plans at the positions determined by the Department. Reference all property markers/corners, monuments or accessories that may be disturbed or buried during construction. Monument of Record forms, available from the Project Engineer, shall be completed and submitted to the Project Engineer for acceptance and recording by the Departments Survey/Locations section prior to any ground disturbing activity. Prior to the completion of the project, reestablish any disturbed property markers/corners, monuments or accessories from the original references in their original position and submit completed Monument of Record forms to the Project Engineer for acceptance and recording by the Departments Survey / Locations section.

Keep records and report to the Project Engineer evidence that a monument has been disturbed and is no longer reliable or cannot be located and is presumed to be lost or obliterated. Establish a minimum of two in-line reference points to all monuments identified for referencing on the Departments Right-of-Way plans or Survey Control sheet. In situations where in-line references are not practical three swing-tie reference points will be accepted. Set references outside of the Right-of-Way limits. Measure all distances to the nearest 0.01 foot. Record referencing of monuments in a separate field book stamped by the Surveyor. It is the Surveyors statutory responsibility to reference any other monuments that may be destroyed during construction whether or

not they are identified on the Right-of-Way plans or Survey Control sheet. Without prior written approval of the Survey Manager for the Region in which the project is located, the use of GPS is not an acceptable method for referencing monuments.

Replace existing monuments disturbed by construction from the original references established prior to construction with Primary or Secondary monuments meeting the requirements of sub-section 642-3.01. Monuments re-established from original reference will not require a final traverse. Any monument that cannot be re-established from original references will require a final traverse as defined by 642-1.02.

Delete the fourth sentence in the paragraph that begins" The Surveyor must complete and stamp..." The sentence to be deleted begins " Deliver conforming copies of the ...".

642-3.05 FINAL TRAVERSE: Delete the first two sentences and add the following: Within 30 days after the Project Engineer receives a letter stating that construction activities that may disturb the monuments has ceased the Surveyor shall run a final closed traverse, as defined by See 642-1.02. The closed traverse will begin and end on the two closest centerline monuments on either side of the monument to be established. The centerline monuments being used to begin and end the traverse must either be undisturbed originals, or have been re-established from original references.

SECTION 643

TRAFFIC MAINTENANCE

Special Provisions

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 minimum 12-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.

Standard Modifications

643–1.04 WORKSITE TRAFFIC SUPERVISOR. Item 1. Qualifications, delete the last paragraph and replace it with the following:

Renew certification no less frequently than every four (4) years, and be able to show their certification anytime they are on the project.

Delete item 2.b. and replace it with the following:

b. Physically inspect the condition and position of traffic control devices used on the project at least once each day and once each night. Ensure that traffic control devices work properly, are clean and visible, and conform to the approved TCP. Complete and sign a detailed written report of each inspection on the form provided by the Engineer within 24 hours.

Delete item 2.h. and replace it with the following:

h. Certify that flaggers are certified as required by Subsection 643-3.04.4. Submit a copy of flagger certifications to the Engineer.

(07/03/03)E06

Special Provisions

643-2.01 MATERIALS. Add the following:

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

(01/18/05)R222USC02

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 becoming aware of the accident. (02/05/04)E10

Special Provisions

643-3.01 GENERAL CONSTRUCTION REQUIREMENTS. Add the following: 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.

Standard Modification

643-3.04 TRAFFIC CONTROL DEVICES. Delete the sixth paragraph and replace it with the following: Use only traffic control devices that meet the requirements of the "Acceptable" category in ATSSA "Quality Standards for Work Zone Traffic Control Devices".

Item 4. Flagging, delete the fourth paragraph and replace it with the following: Renew flagger training and certification no less frequently than every four (4) years. Flaggers must be able to show their flagger certification anytime they are on the project.

(07/03/03)E06

Special Provisions

643-3.04 TRAFFIC CONTROL DEVICES. 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 item 1. Embankments.: Close trenches and excavations at the end of each continuous work shift. When full closure is not practicable at the end of the continuous work shift, provide traffic control conforming to an approved traffic control plan developed in accordance with the ATM.

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

Delete item 4.b. and replace with the following: Flagger Certification by ATSSA

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.

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 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
0-9,999	$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), the following traffic restriction will be allowed:

1. In General. Full road closures will be allowed, except local access shall be provided. While the Middle School is in session, the project area north of Cope Industrial Way shall remain two-way traffic, no lane restrictions will be allowed during that time for that segment.

2. During the Alaska State Fair. Two-way traffic shall be maintained, with the only allowable restriction being the closure of parking lanes where

work is being conducted behind the curb and gutter.

3. Monday to Friday. Traffic shall have no restrictions from 7:00 am to 8:30 am.

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.

Standard Modification

Add the following new subsection:

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 Provisions

643-4.01 METHOD OF MEASUREMENT. Add the following item:

16. Special Construction Signs. 643(11) Special Construction Signs are measured by the total area of legend bearing sign panel, as determined under Subsection 615-4.01. Compensation for a 24-hour period will be made under Item 643(4), Construction Sign.

Add the following: 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.

643-5.01 BASIS OF PAYMENT. Add the following: The Engineer does not require a change order/directive for Item 643(25) Traffic Control.

The Engineer will pay for Item 643(15), Flagging on a contingent sum basis at the rate of $38/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.

Payment for high visibility clothing for workers is subsidiary to other items. (12/02/03)E07

No separate payment will be made for detours. All work necessary to construct, maintain, demolish, and dispose of detours will be subsidiary to Item 643(2), Traffic Maintenance.

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	$0.90
Word or Symbol Markings	Each	$40.00

Delete Item 643(15) and add the following pay item:

Pay Item	Pay Unit
643(15) Flagging	Contingent Sum

(07/07/05)R222USC04

SECTION 644

SERVICES TO BE FURNISHED BY THE CONTRACTOR

Special Provisions

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 sixteen (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 three (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 from Anchorage.

644-2.05 VEHICLES. Delete the second and third paragraphs and substitute the following: Furnish one (1) full-size four-wheel drive pickup(s) or sport utility vehicle(s) for exclusive use of the Department throughout the project. Provide vehicles less than three (3) model years old, in good condition and with less than

36,000 miles on the odometer.

Furnish fuels, maintenance, and insurance. If you are working after October 1, provide studded snow tires for the vehicles you provide for the Department's use. Equip vehicles used by the Department with CB radios and yellow lightbars wired into the vehicle's electrical system with a dash mounted switch easily accessible to the vehicle operator. Provide Code 3; Model 6005H (formerly PE 6200 LE) lightbars, or approved equal. Approved equals shall have the following characteristics:

- Four (4) 55 watt rotators with amber filters
- 1200 flashes per minute
- Two diamond mirrors
- 55 inches in length

You are responsible for normal wear and tear, and any other incidental damage including broken windshields, occurring during the Department's operation and use. The Department is responsible for damage to any vehicle caused by its own negligent during operation.

644-3.01 METHOD OF MEASUREMENT. Delete the third paragraph and substitute the following:

Vehicle. Per each vehicle provided. If a replacement vehicle is necessary, no additional measurement will be made.

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

Add the following pay item:

Payment will be made under:

Pay Item	**Pay Unit**
644(8) Vehicle	Each

(02/03/03)R245USC

SECTION 646

CPM SCHEDULING

Special Provisions

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 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 Provisions

647-1.01 DESCRIPTION. This item consists of furnishing construction equipment, operated, fueled and maintained, on a rental basis for use in construction of extra or unanticipated work at the direction of the Engineer. Construction equipment is defined as that equipment actually used for performing the items of work specified and shall not include support equipment such as, but not limited to, hand tools, power tools, electric power generators, welders, small air compressors and other shop equipment needed for maintenance of the construction equipment.

The work is to be accomplished under the direction of the Engineer, and the Contractor's operations shall at all times be in accordance with the Engineer's instructions. These instructions by the Engineer shall be to the Contractor's supervisory personnel only, not to the operators or laborers. In no case shall these instructions by the Engineer be construed as making the Department liable for the Contractor's responsibility to prosecute the work in the safest and most expeditious manner.

647-2.01 EQUIPMENT FURNISHED. In the performance of this work, the Contractor shall furnish, operate, maintain, service, and repair equipment of the numbers, kinds, sizes, and capacities set forth on the Bid Schedule or as directed by the Engineer. The operation of all 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 each 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.

All equipment shall be in first-class working condition and capable of full output and production. The minimum ratings of various types of equipment shall be as manufactured and based on manufacturer's specifications. Alterations will not be considered acceptable in achieving the minimum rating. Equipment shall be replaced at any time when, in the opinion of the Engineer, their condition is below that normal for efficient output and production.

All equipment shall be fully operated, which shall be understood to include the operators, oilers, tenders, fuel, oil, air hose, lubrication, repairs, maintenance, insurance, and all 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. All personnel furnished by the Contractor shall be, and shall remain during the work hereunder, employees solely of the Contractor.

The Contractor shall furnish, without direct compensation, a job superintendent or Contractor's representative together with such other personnel as are needed for Union, State, or Federal requirements and in servicing, maintaining, repairing and caring for the equipment, tools, supplies, and materials provided by the Contractor and involved in the performance of the work. Also, the Contractor shall furnish, without direct compensation, such transportation as may be appropriate for the personnel.

647-3.01 CONSTRUCTION REQUIREMENTS. The performance of the work shall be in accordance with the instructions of the Engineer, and with recognized standards and efficient methods.

The Contractor shall furnish equipment, tools, labor, and materials in the kinds, number, and at times directed by the Engineer and shall commence, continue, and stop any of the several operations involved in the work only as directed by the Engineer.

Normally, the work is to be done when weather conditions are reasonably favorable, 6 days per week, Mondays through Saturdays, 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 thereof to the nearest one-quarter hour, during which equipment is actively engaged in construction of the project shall be recorded by the Engineer Each day's activity will be recorded on a separate sheet or sheets, which shall be verified and signed by the Contractor's representative at the end of each shift, and a copy will be provided to the Contractor's representative.

647-4.01 METHOD OF MEASUREMENT. 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 in accordance with 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), Wide Pad Dozer, 65 hp Minimum will be paid on a contingent sum basis at the rate of $125/hour on a per hour basis at the rate shown on the bid schedule. 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 wattage than specified will not entitle the Contractor to any extra compensation.

Payment will be made under:

Pay Item	Pay Unit
647(1) Wide Pad Dozer, 65 hp Minimum	Contingent Sum
647(2) Wide Pad Dozer, 65 hp Minimum	Hour
647(5) Backhoe, 4WD, 1cy Bucket, 75hp, 15 foot Depth	Contingent Sum

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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. Remove all improvements that block completion of the work detailed in the Plans as specified herein.
   b. Reconstruct with new materials the nonreusable improvements you remove to complete the work, unless other items in the contract cover the improvement.
   c. Replace with new materials the reusable items you damage, which are specified for reuse.
   d. 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. Subsection deleted in its entirety.

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 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 lighting poles 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. Insulation Resistance (megohm) Test. Complete this test to verify the integrity of each conductor's insulation after pulling the conductors and cables into position and before terminating the conductors. At 500 volts DC, each conductor's insulation shall measure a minimum resistance of 100 megohms or the minimum specified by the manufacturer. With single conductors, complete the test between each conductor and ground. In each multi-conductor cable, complete the test between conductors and between each conductor and ground.

c. Functional. Perform the following tests on lighting system after the component circuits have satisfactorily passed the tests for continuity, grounding, insulation integrity, and circuitry.

d. Perform the functional test for each highway lighting system until the systems burn 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 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.

Add the following new item 9:

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. Under item 1. Cast-in-Place Foundations., add the

following to the first paragraph: Locate the tops of all pole foundations flush with the adjacent finished: walkway, shoulder, or surrounding ground.

1. Cast-in-Place Foundations. In subparagraph f, revise the second sentence to read: Before placing the form or reinforcing steel cage, remove all loose material from the bottom of the hole to ensure the foundation rests on firm, undisturbed ground.

In the second sentence of sub-item i delete "prior to grouting." and substitute "before attaching the skirt."

In the first sentence of sub-item j, delete "concrete pile caps" and substitute "foundations"

k. Install the bottoms of the bottom leveling nuts in a level plane within 1 inch of the top of foundations. Adjust all nuts until their tops form a level plane. Install one washer on top of all leveling nuts and, after setting the pole on these washers, install one washer under all top nuts.

Bring all leveling nuts (bottom nuts) to full bearing on the bottom of the base plate.

Generously lubricate the bearing surface and internal threads of top nuts with beeswax. Tighten all top nuts to a "snug" condition. Use a click-type torque wrench to apply 600 foot-pounds of torque to the "snug" top nuts.

After torquing the top nuts, use a hydraulic wrench to rotate all top nuts an additional one third (120^{o}) turn, while preventing the leveling nuts from turning.

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 6 inch long, nonmetallic, protective sleeve over the conductor. Allow 1 inch of the sleeve and 24 inches of conductor to protrude from the foundations.

2. Pile Foundations. Add the following new item g:

   g. Use no more than one splice per foundation. Locate the splice at least 7 feet from the top of pile.

Replace subsection 660-3.03 with the following:

660-3.03 CONDUIT. 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, except where the Plans specify using polyvinyl chloride conduits. 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 boring or drilling methods. Jacking conduits into position is allowed. However, if subsurface conditions prevent the successful completion of the work, install the conduit(s) by boring or drilling methods without additional compensation.

4. Sweep rigid metal conduits through the open bottom of junction boxes by installing 90 degree rigid metal 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 elbows and in the bottom of conduits at the low points of 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 2 self clinching nylon cable ties.

7. Keep conduits clean. Install grounding bushings and approved plastic insert type plugs on the ends of 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 that conforms to subsection 703-2.02. 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 2 inch conduits and at least 2 inches around conduits larger than 2 inches.

11. Fabricate rigid metal 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 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, 6 inch wide polyethylene marker tape above 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 encountering 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 1¼ to 1 slope (a horizontal to vertical ratio) from the edge of pavement. Do not leave these pits unattended until installing an approved means of protection.

16. When the Plans specify using polyvinyl chloride conduit, install RMC in structures and foundations, between type 2 and 3 load centers and the nearest junction box, and on the surfaces of poles and other structures.

17. 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.

18. Seal conduits leading to electrical equipment mounted on soffits, walls, and other locations below the grade of the serving junction box with an approved duct sealing compound.

19. Install expansion fittings in conduits that cross expansion joints.

20. Install a polypropylene pull rope with a minimum 200 pound tensile strength in future use or spare conduits, and reinstall the plugs. Double back at least two feet of pull rope into both ends of each conduit.

21. The Contractor may install conduits larger than the sizes specified. If used, it must be for the entire length of the run. Reducing couplings or bushings are not allowed. Complete work associated with installing conduits larger than specified without extra compensation.

22. Clean existing conduits that will remain in service using a heavy duty air compressor that delivers at least 125 cubic feet of air per minute at a pressure of 110 pounds per square inch. Clean the conduits before pulling in new cables and after removing cables specified to be removed or replaced as follows:
    - When the conduits contain cables that will remain in service, leave the cables in place during the cleaning, and
    - Ream empty conduits with a mandrel or cylindrical wire brush before blowing them out with compressed air.

23. When modifying existing conduit runs, complete the work as required for new installations using the same sizes and types of conduit. When extending existing conduits, add no more than 90 degrees of horizontal bend to the extension.

24. When installing a junction box in a continuous run of existing conduit, remove a length of conduit in each conduit run and complete the work of installing the conduits, elbows, and nipples as required for a new installation.

25. When adjusting existing junction boxes to a new grade, remove cables and replace the nipples as required to provide the clearances specified for new installations.

26. Remove the ends of abandoned conduits from junction boxes that will remain in service.

Replace subsection 660-3.04 with the following:

660-3.04 JUNCTION BOXES. Install precast reinforced concrete junction boxes of the types specified. For junction boxes that contain traffic signal conductors, furnish cast iron lids with the word TRAFFIC inscribed into them. For junction boxes that contain lighting conductors exclusively, furnish cast iron lids with the word LIGHTING inscribed into them.

When shown, install junction boxes at the station and offset locations specified. When lateral locations are not specified, install junction boxes 8 feet from the face of curb or edge of pavement. If the 8 feet offset falls

1. In a pedestrian facility separated less than 7 feet from the roadway face of curb or edge of pavement, increase the offset and install the junction boxes on the backside of the facility. When lacking the right of way to install junction boxes outside the pathway, install at locations as directed, avoiding curb ramps, curb ramp landings, and the middle of walkways.
2. In a pedestrian facility separated at least 7 feet from the roadway face of curb or edge of pavement, reduce the offset and install the junction box next to the facility.
3. Outside the right of way, install the boxes just inside the right of way line.
4. In a raised median, install junction boxes near the center of the median.
5. In a ditch bottom or area that collects drainage, install the junction boxes at locations as directed.
6. Behind guardrails that shield slopes steeper than 3:1 (a horizontal to vertical ratio), install junction boxes between posts and at least 5 feet back from the face of rail.
7. On top of underground utilities or storm drains, install the junction boxes at locations as directed.

Longitudinally, install junction boxes adjacent to the loop detectors or pole they serve, except avoid installing type 1A junction boxes in driveways and in locations subject to use by heavy trucks. When shown near the ends of medians, install junction boxes at least 10 feet from the median end. When the offsets for electroliers and flashing beacon posts place them near the junction boxes that serve them, install the junction boxes on the side of the electroliers and posts downstream of traffic flow.

Limit the distance between adjacent junction boxes to the following dimensions:

1. 400 feet for conduits that contain signal interconnect cable only.
2. 300 feet for conduits that exclusively contain two loop lead-in cables.
3. 300 feet for conduits that contain a single cable other than signal interconnect.
4. 190 feet for conduits that contains more than one cable.

If the three preceding limitations require installing additional junction boxes not shown on the Plans, the Engineer will pay for them as extra work, otherwise, installing additional junction boxes will be at the Contractor's expense.

After grading the roadside, vertically adjust those junction boxes that do not conform

to the following criteria. In unpaved areas that will not be seeded, in areas adjacent to pedestrian facilities, and in paved medians, install the tops of junction boxes 1 inch below finished grade. In seeded areas, install the tops of junction boxes to 2 inches below the seeded surface.

Bond junction box lids to an equipment grounding conductor according to subsection 660-3.06. Attach the jumpers to the lids with brass or stainless steel hardware.

Install a stone drain under each junction box. Drains shall consist of coarse aggregate for concrete that conforms to subsection 703-2.02. Minimum drain dimensions include an 18" depth and a length and width equal to those of the junction box it drains. Compact the aggregate material as directed to prevent junction box settlement.

In every new and reused junction box, install an electronic marker that consists of an antenna encapsulated in a 4 inch diameter red polyethylene ball. Furnish markers that conform to the American Public Works Association standards for locating power. Markers shall respond to locator devices up to 5 feet away, work at all temperatures, and contain no internal power source.

660-3.05 WIRING. Delete the second paragraph in its entirety and substitute the following:

Do not pull conductors into conduits until the following conditions are met:

a. The prescribed clearances around conduit ends are provided,
b. Crushed rock sumps are installed under junction boxes,
c. Conduit ends protrude above the bottom of junction boxes within the prescribed range,
d. New conduits are free of material that became lodged in them during the completion of the work,
e. Reused conduits are cleaned according to subsection 660-3.03,
f. Junction boxes are set to grade, and
g. Grounding bushings are installed on the ends of metallic conduits.

Delete item 3 in its entirety and substitute the following:

3. Pull, as a unit, the conductors specified to be installed into clean conduits, leaving existing conductors that will remain in service in place.

Add the following line to Table 660-1 under subitem a. of item 9.

LOOP DETECTOR NUMBER	COLORED PAIR
Usually a spare pair	Orange and Black

Delete items 11 and 12 in their entirety and substitute the following:

11. Encapsulate illumination cable splices in rigid 2 piece plastic molds filled with an insulating and sealing epoxy resin. Furnish molds large enough to complete the splices and encase the cable jackets in the epoxy resin. Furnish molds rated for 600 volts AC operation and feature fill and vent funnels for epoxy resin. Fill the splice mold bodies with epoxy resin that is resistant to weather, aromatic and straight chain solvents, and that will not sustain combustion.

12. Encapsulate loop lead-in and telemetry cable splices in rigid, transparent, PVC molds filled with reenterable polyurethane electrical insulating and sealing compound. Furnish splice kits rated for 1000 volts AC operation and direct burial.

    Provide reuseable four piece molds that are held together with stainless steel hose clamps. Two pieces form a cylinder and two flexible end caps seal the ends and allow the conductor entry. Use molds with dimensions suitable for the splice made, encase the cable jackets, and have fill and vent funnels.

    Insert a loose woven polyester web that allows a full ¼ inch of insulating compound to flow between the splice and the inside of the mold. Fill the PVC molds with reenterable polyurethane electrical insulating and sealing compound that cures transparent, is nontoxic, is noncorrosive to copper, and does not support fungi or mold growth.

Add the following items:

18. Retrofit reused poles with new tap wires, fused disconnect kits, and fuses.

19. Whenever conductors can not be terminated as specified in the Plans in circuit breakers due to size, splice a piece of #8 AWG power conductor onto the end of each conductor using an overlap type, 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 5 feet.

Replace subsection 660-3.06 with the following:

660-3.06 BONDING AND GROUNDING. Bond and ground branch circuits according to the NEC and the following requirements. Make noncurrent 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 metallic conduits.

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 installation or removal of conductors from existing conduits, retrofit 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 4 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 inch 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.

Replace subsection 660-3.08 with the following:

660-3.08 SIGNAL AND LIGHTING INSTALLATION REQUIREMENTS. Install signal and lighting equipment according to the details shown on the Plans and the following:

Apply antiseizing compound to the following fasteners: frangible couplings,

mechanical grounding connectors, bolts that secure hand hole covers and signal mounting hardware to poles and mast arms. Remove the fasteners from luminaire mounting brackets, fused disconnect kits, grounding bushings, and signal faces which secure the visors, and apply antiseizing compound to these fasteners before completing the installation.

Before passing conductors through the holes made in posts, poles, and mast arms for wireways, remove the burrs and sharp edges from the inside and outside of these holes.

Until each traffic signal and/or flashing beacon goes into operation, keep the vehicular and pedestrian signal faces covered with beige colored canvas shirts sized to fit the signal faces shown in the Plans. Each signal shirt shall feature elasticized openings that fit over the visors and at least two straps to secure it to the signal. Provide shirts with a legend that reads "out of service" and a center section that allows an operator to see the indications during system tests.

When not shown in the Plans, determine the shaft lengths of lighting and signal poles and signal mast arm connector plate locations to provide the plan mounting heights of luminaires and traffic signal heads.

Furnish work to install foundations for relocated poles, including: conduit, excavation, reinforcing steel, class A concrete, anchor bolts, nuts, and washers.

1. 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.

2. Signal Pole Installation. Install signal poles with a slight rake by plumbing the side of the pole opposite the mast arm just above the base plate. Tighten the nuts on the anchor bolts as described in Section 660-3.02k.

   Cover the gap between the foundation and base plate by installing a metal skirt around the base plate, secured with stainless steel sheet metal screws.

3. Vehicular Signal Head Installation. With two piece mast arms, do not install signal heads within 12 inches on either side of the slip type field splice.

   Attach each side mounted terminal compartment with two ½" x 13 bolts, with washers, threaded into holes tapped into the side of the pole at the location shown on Standard Drawing T-30. Install the vertical pipe members plumb.

When installing 5 section vertically stacked signal heads on the sides of poles, secure the vertical pipe to the pole using a steel conduit hanger mounted 6 inches below the top horizontal pipe.

Aim through phase vehicular signal faces at a point located a distance from the face as shown in Table 660-2. If two through signal faces are not visible from this point at a height of 42 inches above finished grade, consult the Engineer for corrective measures.

TABLE 660-2	
THROUGH PHASE SIGNAL FACE AIMING POINTS	
85^{th} Percentile Speed (mph)	Minimum Visibility Distance (feet)
20	175
25	215
30	270
35	325
40	390
45	460
50	540
55	625
60	715

4. Pedestrian Signal and Push Button Installation. Orient pedestrian signal faces at the center of the crosswalk on the opposite side of the street. Attach each clamshell bracket with two ½" x 13 bolts threaded into holes tapped into the side of the pole. Install a spacer, furnished by the bracket manufacturer, on each bolt.

Install the push button on the crosswalk side of the pole. Install R10-4B (R or L) push button signs above each push button. Furnish signs with the arrow pointing in the direction of the appropriate crosswalk. When channel is used for mounting push button signs, tap the top and bottom sign bolts into the pole.

Install an R10-101 sticker, The Meaning of Pedestrian Signals, on each pole with one or two pedestrian push buttons. With two pedestrian push buttons on a pole, install the sticker between and above the R10-4B signs. With one pedestrian push button, install the sticker directly above the R10-4B sign.

5. High Tower Lighting System Installation. Assemble and install high tower poles according to the written instructions furnished by the manufacturer. To assemble and install poles other than as recommended, furnish a plan stamped by a registered professional engineer to the Engineer for approval. Furnish timbers required to assemble the pole, regardless of the method of assembly.

Position the pole during assembly to avoid moving the pole on the ground when lifting the pole to install it on its foundation. When conditions around a foundation preclude assembling the pole on site, assemble the pole as close as possible to the foundation and move the pole into position for installation on its foundation. Before moving a pole, submit a plan stamped by a register professional engineer for moving poles without damage to the Engineer for approval.

Install the lowering system including masthead assembly, luminaire ring, winch assembly, and cables as instructed by the manufacturer's on site representative.

Install and level the luminaires according to the manufacturer's written installation instructions.

Furnish the Engineer an instruction sheet from the manufacturer for orienting reflectors in luminaires that provide an asymmetrical light distribution. Adjust the luminaire reflectors on each pole according to this sheet until they are oriented in the same direction and distribute light according to the pattern shown on the illumination sheets.

Use steel templates to accurately locate and hold the anchor rods plumb and in proper alignment during concrete placement. Leave this template in place for at least 24 hours after completing concrete placement. The Engineer will reject foundations with anchor rods that are out of position or more than 1:40 out of plumb. The Department does not allow bending of anchor rods to plumb the ends or to move them into position, or altering a pole's base plate to match the anchor bolts.

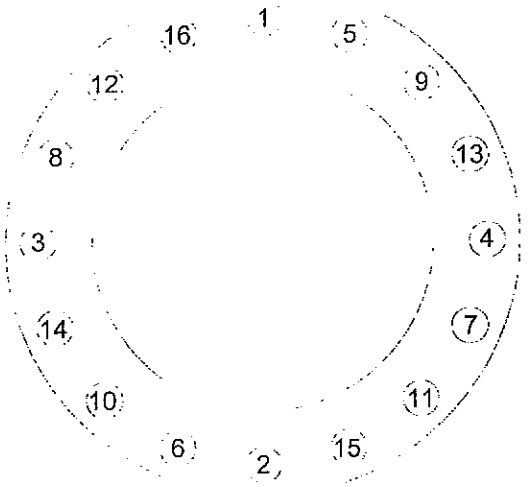
Tighten the nuts that secure high tower lighting poles to concrete foundations according to the following procedure. Use nuts that conform to ASTM Specification A 194 or A 563 of the grade, surface finish, and style for 2 inch diameter anchor rods that conform to ASTM F 1554, Grade 55. Washers shall conform to ASTM F 436 Type 1.

Thread nuts onto the anchor rods to within 1 inch above the top of the concrete base and adjust them downward, if necessary, to provide a minimum ¼ inch projection of the rod above the top of the top nut in the tightened position. Adjust nuts until their tops form a level plane. Install one washer on top of leveling nuts and, after setting the pole on these washers, install one

washer under top nuts.

Bring leveling nuts (bottom nuts) to full bearing on the bottom of the base plate.

Apply beeswax to the top nut bearing face and top nut internal threads before threading it onto the anchor rod. Tighten top nuts to a "snug" condition. Use a click type torque wrench to apply 600 foot pounds of torque to the "snug" top nuts. Torque the top nuts in the following crisscross pattern.



After torquing the top nuts, use a hydraulic wrench to rotate top nuts an additional one third (120°) turn, while preventing the leveling nuts from turning. Use the crisscross pattern shown above.

6. Underpass Lighting System Installation. Mount the luminaires as detailed on the drawings to orient the axis of the lamp perpendicular to the axis of the underpass.

7. Flashing Beacon Installation. When the Plans specify using the flasher in a signal controller cabinet to energize beacons, furnish a two pole, fused block with built in fuse pullers and two fuses to protect the flasher. Furnish and leave 5 feet of cable in the cabinet. Others will install the fused block and terminate the beacon cables.

8. Wood Pole Installation. Place the poles in the ground to at least 6 feet deep.

After setting each pole in the ground, backfill the space around the pole with selected earth or sand, free of rocks 4 inches and larger, or deleterious material. Place the material in layers approximately 4 inches thick and thoroughly compact them with mechanical tampers.

Furnish poles that provide a minimum vertical clearance of 21 feet between the pavement and low point of overhead conductor.

660-3.09 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS. Delete this subsection in its entirety and substitute the following: 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 the existing lighting systems is not kept fully operational as specified herein, the Engineer will reduce the payments 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 equipment damaged before the transfer of maintenance responsibility. Therefore, before starting work on the project, inventory the condition of the existing equipment with the Engineer and document the damaged and defective equipment. If beginning work before providing the Engineer with an inventory, the Contractor waives 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.

Records. 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 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 6 feet.

Alignment. 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 8 feet to the right of the signal centered over the through lane.

6. For pedestrian signals, maintain 7 to 9 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. Add the following:

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. Add the following: The amount bid for an item shall include full compensation for:

1. Excavation, bedding, and backfill to install the components shown in the Plans. Dewatering excavations is subsidiary to completion of the excavation work.

2. Removing and repairing existing improvements to complete the work, unless other items in the contract cover the repairs.

3. Work associated with installing loop detectors, including: saw cutting, asphalt removal, aggregate base course, tack coating, and installing new asphalt concrete.

The Engineer will pay for the disposal of surplus and unusable excavation and for imported backfill and bedding material at respective contract unit prices, or as extra work if the contract does not include these items.

The costs of repairing damage to finishes on new equipment are a subsidiary obligation.

The costs of maintaining the existing and temporary electrical system to keep them fully operational is subsidiary to 660 items included in the contract.

For each mile of roadway with existing lighting systems that is not kept fully operational, the Engineer will deduct $1275.00 per day from the payments due the Contractor.

Payment will be made under:

Pay Item	Pay Unit
660(22) Illumination Price Adjustment	Contingent Sum

(08/02/05)R66USC02

SECTION 661

ELECTRICAL LOAD CENTERS

Special Provisions

661-2.01 MATERIALS. Under Meters, add the following: Furnish meter sockets and landing pads rated for 200-ampere services.

Add the following: Ground Rods. Furnish one-piece ¾" diameter by 10 feet long copper clad steel rods.

Ground Rod Clamps. Furnish one piece bronze clamps with a hex head setscrew, which are suitable for direct burial and for use with copper clad ground rods.

661-3.01 CONSTRUCTION REQUIREMENTS. Delete the 11th paragraph, and substitute the following: Install two ground rods at least 6 feet apart at each load center. Connect the neutral bus to the ground rods with a soft drawn bare copper conductor sized per the NEC, 6 AWG minimum. Bond all non-current carrying metal parts in each load center to the ground bus.

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.

SECTION 670

TRAFFIC MARKINGS

Special Provisions

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. 15 days before starting work meet with the Engineer for a prestriping meeting. At this meeting, do the following:

1. Furnish a striping schedule showing areas and timing of work, placing materials and the Traffic Control Plans to be used.
2. Discuss placement of materials, potential problems.
3. Discuss work plan at off ramps, on ramps and intersections.
4. Discuss material handling procedures.
5. Provide copies of the manufacturer's installation instructions and copies of the Material Safety Data Sheets.

b. Manufacturer's Representative. Provide the services of a manufacturer's representative (the "Manufacturer's Representative"). Ensure the Manufacturer's Representative observes the application of the pavement marking materials. Cooperate with the Manufacturer's Representative and the Engineer to ensure that the materials are placed according to these Specifications and the manufacturer's recommended procedures.

c. Manufacturer Certified Installers. Install 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 use truck mounted automatic extrusion equipment capable of installing a double line in a single pass. Use automatic bead applicators that place a uniform layer of beads on the lines. Hand units will not be allowed.

For Transverse markings legends, symbols, and transverse markings use manual or automatic application equipment. Stencils or extruders are required to form sharply defined markings

For inlaid applications use grooving equipment that produces a dry cut. Use vacuum shrouded equipment or other equally effective containment procedures. Install markings in the same work shift as the grooving operation.

(1) Longitudinal Markings Surface Applied. Apply markings for lane lines, edge lines, and centerlines to yield a thickness of 90 mils as measured from the surface of the pavement. Use Type B material, as specified in subsection 712-2.17.

(2) Longitudinal Extruded Markings Inlaid. Apply markings for lane lines, edge lines, and centerlines to yield a thickness of 250 mils as measured from the surface of the pavement. Use Type b material. Groove the area for the inlaid markings to a depth of 250 mils.

(3) Transverse and Symbol Markings Inlaid. Apply markings for onlys, arrows, stop bars, gore stripes, railroad symbols, and cross walks to yield a thickness of 250 mils as measured from the surface of the pavement. Use Type C material, as specified in subsection 712-2.17. Groove the area for inlaid marking to a depth of 250 mils.

(4) Traverse and Symbol Markings Surface Applied. Apply markings for onlys, arrows, stop bars, gore stripes, and cross walks to yield a thickness of 120 mils as measured from the surface of the pavement. Use Type C material.

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. On the form provided by the Engineer, 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 and depth of slot are measured from the surface of the pavement.

(1) For inlay applications, record the depth of the slot every 300 feet during the grinding operation.

(2) For other longitudinal applications, measure the thickness of the lines (above the pavement surface), at the time of application, every 300 feet.

(3) For surface applied transverse markings measure the thickness in three locations for each marking.

(4) 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.

(5) Measure the retroreflecivity of each transverse marking at three locations, and of each line at intervals not to exceed 1,500 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. Add the following: Coordinate removal work with construction activity. Remove pavement markings the same day permanent markings are applied, unless otherwise directed. Use vacuum shrouded equipment or other equally effective containment procedures.

Add the following subsection:

670-3.07 TOLERANCES FOR METHYL METHACRYLATE PAVEMENT MARKINGS.

1. Length of Stripe. ± 2 inches.
2. Width of Stripe. ± 1/8 inch.
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
8. Thickness of surface applied. Minimum specified to a maximum of + 30 mils.
9. Depth of Inlay Slot. Minimum 250 mils to a maximum of 290 mils.
10. Thickness of Inlaid Marking Material. Fill inlay area completely from the bottom of the inlay to the surface of the pavement.

If it is determined that the material is being placed too thin, 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 inlay slot is not ground to the specified depth.
7. The inlay slot is not filled to the specified depth.
8. The edge of the markings are not clear cut and free from overspray.
9. The reflective elements are not properly embedded.
10. The markings exhibit poor adhesion.
11. The retro-reflectivity of the markings is less than specified.
12. 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.

Delete Items 2 and 3 and replace with the following:

2. Square Foot Basis. Transverse pavement marking lines, stop bars, cross walks and gore stripes will be measured by nominal width times actual length. This does not include 24" wide lines required for Railroad Markings.

3. Each. Symbol pavement markings only's and arrow's will be measured on a unit basis with each separate word or symbol constituting a unit. Railroad Markings will be measured by the complete unit shown for each lane of travel.

4. Foot Basis: Longitudinal Pavement Markings, surface applied or inlaid, will

be measured by the linear foot of 4 inch wide line. Wider striping will be measured in multiples of 4 inches.

670-5.01 BASIS OF PAYMENT. Add the following: 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 an open graded pavement.

Milling for installation of the inlaid markings is subsidiary to 670 items. Payment includes costs associated with this item, including the removal of millings.

Payment will be made under:

Pay Item	Pay Unit
670(10A) MMA Pavement Markings Longitudinal Surface Applied	Linear Foot
670(10B) MMA Pavement Marking Railroad Symbols Surface Applied	Each
670(10C) MMA Pavement Marking Only and Arrow Surface Applied	Each
670(10D) MMA Pavement Transverse Markings Surface Applied	Square Foot
670(10E) MMA Pavement Markings Longitudinal Inlaid	Linear Foot
670(10F) MMA Pavement Markings Railroad Symbols Inlaid	Each
670(10G) MMA Pavement Markings Only and Arrow Inlaid	Each
670(10H) MMA Transverse Markings Inlaid	Square Foot

(05/23/05)R246usco04

SECTION 702

ASPHALT MATERIALS

Special Provisions

702-2.01 ASPHALT CEMENTS. Add the following. Performance Graded Asphalt Binder shall conform to the requirements of AASHTO MP1 and the additional properties defined by AASHTO T-53 and ASTM D5801 assigned to each grade.

	Performance Graded Asphalt Cement		
	PG 52-28	PG 58-28	PG 64-28
Softening Point AASHTO T-53	(none)	120 °F	125°F
Toughness min. ASTM D5801	(none)	110 inch-lb.	110 inch-lb.
Tenacity min. ASTM D5801	(none)	75 inch-lb.	75 inch-lb.

(10/26/05)R199USC04

SECTION 703

AGGREGATES

Special Provisions

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
¾ 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

(10/26/05)R199USC04

703-2.04 AGGREGATE FOR ASPHALT CONCRETE PAVEMENT. Replace this subsection with the following:

Coarse Aggregate (retained on the No. 4 sieve). Crushed stone or crushed gravel consisting of sound, tough, durable rock of uniform quality. Remove natural fines passing a #4 sieve before crushing aggregates for Type V or VH asphalt concrete mixtures. Free from clay balls, organic matter, and other deleterious material. Not coated with dirt or other finely divided mineral matter. Meet the following requirements (note A or B indicate class of mix, see Table 401-1), the Engineer may modify the fracture requirements if the hard aggregate sources stated in 106-1.02 do not meet specifications:

		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	98, 2 face	98, 2 face
Thin-Elongated Pieces, max % **1:5** **1:3**	ATM 306	 8 20	 8 -	 3 8	 3 8
Nordic Abrasion, max.%	ATM 312			12	8
Absorption, max. %	AASHTO T85	2.0		2.0	2.0

TABLE 703-3
BROAD BAND GRADATIONS FOR ASPHALT CONCRETE PAVEMENT AGGREGATE
Percent Passing by Weight

SIEVE	**GRADATION**				
	Type I	**Type II**	**Type III**	**Type IV**	**Type V, VH**
1 inch	100				100
¾ inch	80-90	100			90-100
½ inch	60-84	75-90	100	100	65-75
3/8 inch	48-78	60-84	80-90	80-95	48-60
No. 4	28-63	33-70	44-81	55-70	30-40
No. 8	14-55	19-56	26-70	35-50	20-30
No. 16	9-44	10-44	16-59	20-40	≤22
No. 30	6-34	7-34	9-49	15-30	≤17
No. 50	5-24	5-24	6-36	10-24	≤14
No. 100	4-16	4-16	4-22	5-15	≤12
No. 200	3-8	3-8	3-8	3-8	3-8

(10/26/05)R199USC04

Fine Aggregate (passing the #4 sieve. Meet the quality requirements of AASHTO M 29, including S1.1, Sulfate Soundness.

For Type IV, V and VH mixes, remove 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, and meets the following:

Property	Test Method	Requirement
Fine Aggregate Angularity	AASHTO T 304	45% min.

(10/26/05)R199USC04

delete

SECTION 712

MISCELLANEOUS

Special Provisions

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

712-2.14 PREFORMED PAVEMENT MARKING TAPE. Add the following to paragraph a. under item 1., General Requirements: The preformed ribbon shall consist of one solid piece of required width and length. In solid stripe areas, the tape length shall, where possible, be a minimum of 100-feet. (07/15/96)R79USC

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:

   1. 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. (05/23/05)R246usco04

SECTION 724

SEED

Special Provisions

724-2-02. MATERIALS. Delete Table 724-1 and substitute with 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

SECTION 726

TOPSOIL

Special Provisions

726-2.01 TOPSOIL. Delete item 2 and substitute the following:

2. Contain between 10 percent and 20 percent organic matter as determined by loss-on-ignition of oven dried samples according to ATM 203.

(02/25/05)R139USC

Add the following: Topsoil stripped from the project and pulverized or shredded vegetation from the project may be incorporated into the topsoil provided that the resulting mixture meets the above requirements. (ANH 12/08/04)

SECTION 730

SIGN MATERIALS

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

SECTION 740

SIGNALS AND LIGHTING MATERIALS

Special Provisions

Replace subsection 740-2.02 with the following:

740-2.02 SIGNAL AND LIGHTING POLES. Design and fabricate highway lighting 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. For the design and fabrication of high tower poles, see subsection 740-2.04.

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.

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.

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 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.

Otherwise use: 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 5/16 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 5/16 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. 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.

7. 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

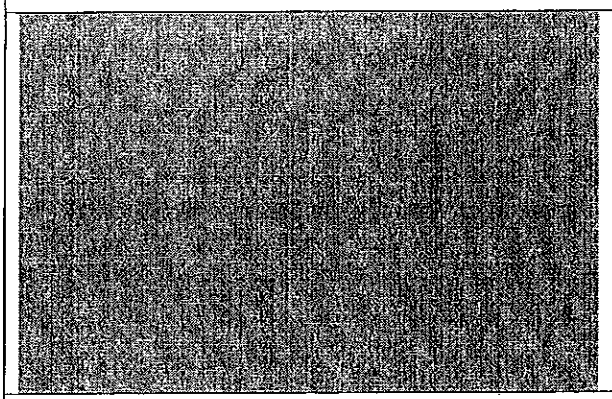
4. Grind exposed welds flush with the base metal, except fillet welds and seam welds on top of mast arms. Grinding seam welds on multi-sided poles is not required, except in slip type joints.

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
		
Light Poles		
a) Luminaire mast arm length	15 ft./*15 ft.*	LMA 15/*LMA 15*
b) Pole height	37 ft.	PH 37
Luminaire Mast Arm		
a) Mast arm length	18 ft.	LMA 18
b) Pole number (if unique arm design)		P 4

Replace subsection 740-2.06 with the following:

740-2.06 ELECTRICAL CONDUIT AND FITTINGS. Unless specified otherwise, use schedule 80 polyvinyl chloride (PVC) conduit and fittings meeting

NEMA TC 3 for all raceways. Furnish rigid type PVC conduit and elbows that conform to NEMA TC3.

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.

Furnish conduit outlet bodies and their covers with a hot dip galvanized finish and stainless steel screws. For photoelectric control installation, furnish types C and LB conduit bodies.

When Myers hubs are specified, furnish rain-tight, grounding type hubs made of malleable iron with a hot-dip or mechanically galvanized finish.

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.

Replace subsection 740-2.18 with the following:

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.
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.

Delete subsection 740-2.20 in its entirety.

Delete subsection 740-2.22 in its entirety