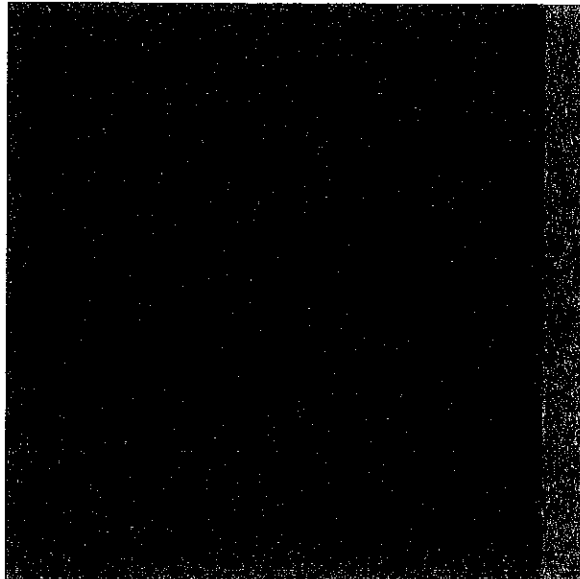


PART 4
STANDARD MODIFICATIONS
AND SPECIAL PROVISIONS
to the
STATE OF ALASKA
SPECIFICATIONS
FOR
HIGHWAY CONSTRUCTION
2004



GLENN HIGHWAY/W. DOGWOOD AVENUE INTERSECTION
Project No. IM-OA1-6(33)/57871

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SECTION 102

BIDDING REQUIREMENTS AND CONDITIONS

Standard Modification

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

Special Provisions

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. (07/01/04)R171USC04

SECTION 105
CONTROL OF WORK

Special Provisions

105-1.06 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.

Anchorage Area..... 278-3121
Statewide.....800-478-3121

Who will notify the following:

- | | |
|-----------------------------|------------------------------|
| • City of Palmer | • Matanuska Telephone Assoc. |
| • GCI | • ENSTAR Natural Gas |
| • Matanuska Electric Assoc. | |

Call the DOT&PF's Palmer Maintenance & Operations Office directly at 269-0782.

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

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

Payment will be made as follows:

1. Subsidiary to Item 642(1), Construction Surveying, if the Contractor is required to provide the surveying as part of the contract an/or
2. Under Item 642(3), Three Person Survey Party, if the construction or Right of Way staking required by the utility is either in advance of the two (2) week work plan, or not required by the contract.

The utility shall give you, through the Engineer, fifteen (15) calendar days advance written notice for required staking.

(09/01/04)R3

Specific coordination requirements for the specific utilities are included below:

Enstar Natural Gas Company (ENSTAR) has underground natural gas lines on both sides of the Glenn Highway between Evergreen Avenue and Dogwood Avenue. From station 1646+00 LT to 1648+00 LT the existing 4" plastic gasline will be adjusted in place to maintain the required cover above the lines. At "C" station 7+45 the existing 2-inch plastic gasline crossing the proposed Carrs Extension will also be adjusted to maintain the required cover above the lines. Enstar will require two (2) calendar days at each location to complete the required work.

The contractor shall comply with ENSTAR's "Safety Requirements for Excavation Adjacent to Natural Gas Pipelines" when working within 10 feet of their facilities. If encountered, ENSTAR lines must be continuously supported during excavation and backfill. Extreme caution must be exercised during excavation and backfill operations to prevent damage to the pipe and pipe coating.

Matanuska Electric Association, Inc. (MEA) has underground electric lines within the project area. MEA will excavate, adjust and place split duct conduit around the existing underground circuit that parallels the west side of the Glenn highway, at the intersection with the new access into Carr's Parking lot at approximate station "G" 1647+00. MEA will also place split duct conduit at the intersection with the extension of Dogwood Ave. at approximate station "G" 1652+00, "D" 18+75. MEA will require two (2) calendar day at each location, to complete the work.

MEA's crossing of the Glenn highway at station 1649+80 will be lowered to accommodate the ditch cut on the left side. MEA requires four (4) calendar days to complete this work.

An MEA inspector will be required to be onsite while work is underway near the underground feeder on the Dogwood Ave extension, from the crossing at station "D" 20+95 to station "D" 22+90 Lt.. MEA will require seven (7) calendar days written notice prior to any excavation in the area of the cables.

Matanuska Telephone Association, Inc. (MTA) has underground telephone lines within the project area. MTA will replace the existing crossing at "C" Station 7+45 crossing the proposed Carrs Extension. MTA will excavate below the proposed section place conduit and install new cable and cutover service to the new cable. MTA will require four (4) calendar days to complete the work.

Standard Modification

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

Special Provisions

105-1.17 CLAIMS FOR ADJUSTMENT AND DISPUTES. 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

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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.

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 permits on the Contractor's behalf, as contained in Appendix A:

1. Alaska Department of Environmental Conservation (DEC), Stormwater Review, Letter of Non-Objection, Stormwater Project No. 05-WW-269-015, dated October 21, 2004.

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

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
Training Program
Federal EEO Bid Conditions

Section 120
Section 645
Form 25A-301

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EEO-1 Certification
DBE Subcontractable Items
ADOT&PF Training Program Request
Training Utilization Report
Contact Report
DBE Utilization Report
Summary of Good Faith Effort Documentation
Required Contract Provisions, Federal-Aid Contracts

Form 25A-304
Form 25A-324
Form 25A-310
Form 25A-311
Form 25A-321A
Form 25A-325C
Form 25A-332A
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. (08/13/98)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

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

109-1.06 PROGRESS PAYMENTS. Add the following: Failure to submit schedules in accordance with Subsection 108-1.03, Prosecution and Progress will result in withholding an amount equal to 5 percent of the total amount earned from all subsequent progress payments. The Engineer, upon receipt of current schedules from the Contractor, will release this amount.

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

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. (6/30/04)E11

Add the following Section:

SECTION 120

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM

120-1.01 DESCRIPTION. The work consists of providing Disadvantaged Business Enterprises (DBEs), as defined in Title 49, CFR (Code of Federal Regulations), Part 26, with the opportunity to participate on an equitable basis with other contractors in the performance of contracts financed in whole, or in part, with federal funds. The Contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. Carry out applicable requirements of 49 CFR Part 26 in the award and administration of USDOT assisted contracts.

120-1.02 INTERPRETATION. It is the intent of this section to implement the requirements of 49 CFR, Part 26, and the Department's federally approved DBE Program.

120-1.03 ESSENTIAL CONTRACT PROVISION. Failure to comply with the provisions of this section will be considered a material breach of contract, which may result in the termination of this contract or such other remedy as ADOT&PF deems appropriate. The Department also considers failure to comply with this section to be so serious as to justify debarment action as provided in AS 36.30.640(4).

120-1.04 DEFINITIONS AND TERMS. The following definitions will apply.

1. Broker. A DBE certified by the Department that arranges for the delivery or provision of creditable materials, supplies, equipment, transportation/hauling, insurance, bonding, etc., within its certified category, that is necessary for the completion of the project. A broker of materials certified in a supply category must be responsible for scheduling the delivery of materials and fully responsible for ensuring that the materials meet specifications before credit will be given.
2. Commercially Useful Function (CUF). The execution of the work of the Contract by a DBE carrying out its responsibilities by actually performing, managing, and supervising the work involved using its own employees and equipment. The DBE shall be responsible, with respect to materials and supplies used on the Contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a 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 determination of CUF is made by the Engineer after evaluating the way in which the work was performed during the execution of the Contract.

3. Disadvantaged Business Enterprise (DBE). An enterprise which is a for-profit small business concern
 - a. that is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock is owned by one or more such individuals;
 - b. whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it; and
 - c. has been certified by the Department in accordance with 49 CFR, Part 26.
4. DBE Key Employee. Permanent employees identified by the DBE owner in its certification file in the Department Civil Rights Office.
5. DBE Utilization Goal. The percent of work to be performed by certified DBEs that is established by the Department and specified in the Contract.
6. Good Faith Efforts. Efforts by the bidder or Contractor to achieve a DBE goal or other requirement of 49 CFR Part 26, by their scope, intensity, and appropriateness to the objective, that can reasonably be expected to fulfill the program requirement.
7. Manufacturer. A DBE certified by the Department in a supply category that changes the shape, form, or composition of original material in some way and then provides that altered material to the project and to the general public or the construction industry at large on a regular basis.
8. Notification. For purposes of soliciting DBE participation on a project and to count toward a Contractor's Good Faith Efforts, notification shall be by letter or fax transmission, with a return receipt requested or successful transmission report. Telephonic contact with a DBE may be allowed, however it shall be based on the ability of Civil Rights staff to independently verify this contact.
9. Regular Dealer. A DBE certified by the Department in a supply category that
 - a. maintains an in-house inventory on a regular basis of the particular product provided to this project; and
 - b. keeps an inventory in an amount appropriate for the type of work using that product; and
 - c. offers that inventory for sale to the general public or construction industry at large (private and public sectors), not just supplied as needed on a project by project basis during the construction season, except where the product requires special or

heavy equipment for delivery and the DBE possesses and operates this equipment on a regular basis throughout the construction season in order to deliver the product to the general public or construction industry at large. If the distribution equipment is rented or leased, it must be on a repetitive, seasonal basis; and may additionally

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

120-2.01 UTILIZATION GOAL. The DBE Utilization Goal for this contract is shown on Form 25A324 (DBE Subcontractable Items) as a percentage of the total basic bid amount. A DBE may be considered creditable towards meeting the DBE Utilization Goal at time of Contract award, if the DBE is certified by the Department in a category covering the CUF to be performed at the time of listing on Form 25A325C (DBE Utilization Report).

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

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

120-3.01 DETERMINATION OF COMPLIANCE.

1. Phase I - Bid. Each bidder must register with the Civil Rights Office annually in accordance with §§26.11 & 26.53(b)(2)(iv) of 49 CFR, Part 26. No contract may be awarded to a bidder that is not registered.
2. Phase II - Award. The apparent low bidder will provide the following within 15 days of receipt of notice of intent to award:
 - a. **Written DBE Commitment.** Written commitments from DBEs to be used on the project. The written commitment shall contain the following information:
 - 1) A description of the work that each DBE will perform;
 - 2) The dollar amount of participation by the DBE firm;
 - 3) Written documentation of the bidder/offeree'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
 - d. 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 cannot document the minimum required Good Faith Efforts (as outlined in Subsection 120-3.02 below), the Contracting Officer will determine the bidder to be not responsible.
3. Phase III - Construction.
- a. **Designation of DBE/EEO Officer.** At the preconstruction conference, submit, in writing, the designation of a DBE/EEO officer.
 - b. **DBE Creditable Work.** The CUF work items and creditable dollar amounts shown for a DBE on the DBE Utilization Report (Form 25A325C) shall be included in any subcontract, purchase order or service agreement with that DBE.
 - c. **DBE Replacement.** If a DBE replacement is approved by the Engineer, replace the DBE with another DBE for the same work in order to fulfill its commitment under the DBE Utilization Goal. In the event the Contractor cannot obtain replacement DBE participation, the Engineer may adjust the DBE Utilization Goal if, in the opinion of the Engineer and the Civil Rights Office, both of the following criteria have been met:
 - 1) The Contractor has not committed any discriminatory practice in its exercise of good business judgment to replace a DBE.
 - 2) If the Contractor is unable to find replacement DBE participation and has adequately performed and documented the Good Faith Effort expended in accordance with Subsection 120-3.02.
 - d. **DBE Utilization Goal.** The DBE Utilization Goal will be adjusted to reflect only that amount of the DBE's work that cannot 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 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 cannot 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 seven (7) calendar days prior to bid opening. The bidder must give the DBEs no less than five (5) days to respond. The bidder may reject DBE quotes received after the deadline. Such a deadline for bid submission by DBEs will be consistently applied. DBEs certified to perform work items identified on Form 25A324 must be contacted to solicit their interest in participating in the execution of work with the Contractor. Each contact with a DBE firm will be logged on a Contact Report (Form 25A321A).
- d. Non-competitive DBE quotes may be rejected by the bidder. Allegations of non-competitive DBE quotes must be documented and verifiable. A DBE quote that is more than 10 percent higher than the accepted non-DBE quote will be deemed non-competitive, provided the DBE and non-DBE subcontractor quotes are for the exact same work or service. Bidders must have a non-DBE subcontractor quote for comparison purposes. Such evidence shall be provided in support of the bidder's allegation. Where the bidder rejects a DBE quote as being non-competitive under this condition, the work must be performed by the non-DBE subcontractor and payments received by the non-DBE subcontractor during the execution of the Contract shall be consistent with the non-DBE's accepted quote. This does not preclude increases as a result of Change documents issued by the Department.
- e. Provision of assistance to DBEs who need help in obtaining information about bonding or insurance required by the bidder.
- f. Provision of assistance to DBEs who need help in obtaining information about securing equipment, supplies, materials, or related assistance or services.
- g. Providing prospective DBEs with adequate information about the requirements of the Contract regarding the specific item of work or service sought from the DBE.
- h. Follow-up of initial notifications by contacting DBEs to determine whether or not they will be bidding. Failure to submit a bid by the project bid opening or

deadline by the bidder is de facto evidence of the DBE's lack of interest in bidding. Documentation of follow-up contacts shall be logged on the Contact Report (Form 25A321A).

- i. Items c through h will be utilized to evaluate any request from the Contractor for a reduction in the DBE Utilization Goal due to the default or decertification of a DBE and the Contractor's subsequent inability to obtain additional DBE participation.
2. **Administrative Reconsideration.** Under the provisions of 49 CFR. Part 26.53(d), if it is determined that the apparent successful bidder has failed to meet the requirements of this subsection, the bidder must indicate whether they would like an opportunity for administrative reconsideration. Such an opportunity must be exercised by the bidder within three (3) calendar days of notification it has failed to meet the requirements of this subsection. As part of this reconsideration, the bidder must provide written documentation or argument concerning the issue of whether it met the goal or made adequate good faith efforts to do so.
- a. The decision on reconsideration will be made by the DBE Liaison Officer.
 - b. The bidder will have the opportunity to meet in person with the DBE Liaison Officer to discuss the issue of whether it met the goal or made adequate good faith efforts to do so. If a meeting is desired, the bidder must be ready, willing and able to meet with the DBE Liaison Officer within four (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 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) Subcontract work, with the exception of truck hauling, will be sublet by the same unit of measure as is contained in the Bid Schedule unless prior written approval of the Engineer is obtained.
- 7) The DBE will control all business administration, accounting, billing, and payment transactions. The prime contractor will not perform the business, accounting, billing, and similar functions of the DBE. The Engineer may, in accordance with AS 36.30.420(b), inspect the offices of the DBE and audit the records of the DBE to assure compliance.

- g. On a monthly basis, report on Form 25A336 (Monthly Summary of DBE Participation) to the Department Civil Rights Office the payments made (canceled checks or bank statements that identify 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, immediately notify the Engineer of the default and the circumstances surrounding the default.

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

1. The Contractor was not at fault or negligent in the default and that the circumstances surrounding the default were beyond the control of the Contractor; and
2. The Contractor is unable to find replacement DBE participation at the same level of DBE commitment and has adequately performed and documented the Good Faith Effort expended in accordance with items c through h of Subsection 120-3.02 for the defaulted work; or
3. It is too late in the project to provide any real subcontracting opportunities remaining for DBEs.

The DBE Utilization Goal will be adjusted to reflect only that amount of the defaulted DBE's work that cannot 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 percent 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 percent 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 percent 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 percent 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 percent 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 percent 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 percent of the premium cost.
8. Credit for the CUF of a joint venture (JV) (either as the prime contractor or as a subcontractor) may not exceed the percent of the DBE's participation in the joint venture agreement, as certified for this project by the Department. The DBE joint venture partner will be responsible for performing all of the work as delineated in the certified JV agreement.

120-5.01 BASIS OF PAYMENT. Work under this item is subsidiary to other contract items and no payment will be made for meeting or exceeding the DBE Utilization Goal.

If the Contractor fails to utilize the DBEs listed on Form 25A325C as scheduled or fails to submit required documentation to verify proof of payment or documentation requested by the Department to help in the determination of CUF, the Department will consider this to be unsatisfactory work. If the Contractor fails to utilize Good Faith Efforts to replace a DBE, regardless of fault (except for Subsection 120-3.04 item 3), the Department will also consider this unsatisfactory work. Unsatisfactory work may result in disqualification of the Contractor from future bidding under Subsection 102-1.13 and withholding of progress payments consistent with Subsection 109-1.06. (11/17/00)s33

SECTION 201

CLEARING AND GRUBBING

Special Provisions

201-5.01 BASIS OF PAYMENT. Add the following: Clearing and grubbing for utility relocation work shall be included in the lump sum payment.

SECTION 202

REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Special Provisions

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 269-7590.

(3/29/01)R84USC

SECTION 203

EXCAVATION AND EMBANKMENT

Special Provisions

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

Add the following: Where the plans call for placement of selected material and excavation is required, the existing material may be left in place at the Engineer's discretion if tests determine that it will meet the appropriate selected material requirements. Reduction in excavation or Borrow quantities because of this condition shall not constitute a basis for adjustment in contract unit prices except as provided for in Section 104 Scope of Work. (11/18/04)R23USC02

203-5.01 BASIS OF PAYMENT. Add the following Pay Item:

<u>Pay Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
203(19)	Obliteration of Roadway and Pathway	Lump Sum

SECTION 301

AGGREGATE BASE AND SURFACE COURSE

Special Provisions

301-2.01 MATERIALS. Add the following: Recycled asphalt material (RAM) may be substituted for aggregate base course, inch for inch, if the following conditions are met:

1. RAM shall be crushed or processed to 100 percent by weight passing the 1.5 inch sieve and 95-100 percent by weight passing the 1 inch sieve.
2. The gradation of the extracted aggregate shall meet the following:

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

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

301-3.01 PLACING. Add the following: Base course material used for the sidewalk and pathway foundation shall be placed with a "Layton box" or similar equipment capable of providing a specified depth with a uniform surface. (9/1/89)R26

301-3.03 SHAPING AND COMPACTION. Add the following: If recycled asphalt material is substituted for aggregate base course, the following conditions shall be met:

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

2. After the appropriate coverage with the vibratory compactor, a minimum of 6 passes with a pneumatic tire roller shall be completed. Tires shall be inflated to 80 psi (\pm 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

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 percent and minus 1 percent, and the #200 sieve is limited by the broad band limits.

GLENN HIGHWAY/W. DOGWOOD AVENUE INTERSECTION
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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 with 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.

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 percent 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 the right to a retest under subsection 401-4.02.

Submit a paving and plant control plan at the prepaving 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.

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.

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. Cyclic low density areas are defined as spots or streaks in the pavement that are less than 89 percent of the reference maximum density. If there is a temperature differential that exceeds 25° F within the newly placed mat, low density is likely to occur. The real time thermal images and thermal profile data will become part of the project records shared with the Contractor. The Contractor

shall immediately adjust his laydown procedures to correct the problem. If the Engineer observes four or more areas in any given pay lot where the thermal images indicate cyclic low density is probable, he will order those areas to be cored for determination of density. These cores will be evaluated under subsection 401-4.03.

The target value for density is 94% of the maximum specific gravity (MSG), as determined by WAQTC FOP for AASHTO T 209. For the first lot of each type of asphalt concrete pavement, the Job Mix Design will determine the MSG. For additional lots, the MSG will be determined by the sample from the first subplot 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 all longitudinal joints with Crafcro 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 16 foot straightedge. Correct variations from the testing edge, between any two contacts of more than 1/4 inch.

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401-3.16 PATCHING DEFECTIVE AREAS. Remove 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 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.

401-4.01 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 subplot multiplied by the total weight represented by that subplot. 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 subplot 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 subplot, 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 in accordance with ATM 405 or WAQTC FOP for AASHTO T 308.
2. Asphalt Cement Quality. The Contractor shall sample asphalt cement from the asphalt cement supply line when requested, witnessed by the Engineer's representative. After purging residual asphalt cement, take 3 one quart samples into wide mouth one quart metal containers. Asphalt cement will be sampled for acceptance testing 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 subplot at the randomly selected location marked by the Engineer. Use a core extractor to prevent damage to the core. The Engineer will determine the density of the core samples 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 subplot of a lot will include retesting for the MSG.

401-4.03 EVALUATION OF MATERIALS FOR ACCEPTANCE.

EVALUATION OF ASPHALT CONCRETE

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

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

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

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

The Engineer will reject asphalt concrete mixture that appears to be defective based on visual inspection. A minimum of two samples will be collected from the rejected mixture and tested if requested. If all test results are within specification limits, payment will be made for the mixture. If 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.

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 subplot will not be included in the price adjustment.

The density test result for that subplot 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 subplot 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: $\bar{x} = \frac{\sum x}{n}$

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.

$$(\sum x)^2 = \text{square of the sum of the individual test values.}$$

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

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

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

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

Where: LSL = Lower Specification Limit

Q_L is rounded to the nearest hundredth.

6. P_U (percent within the upper specification limit which corresponds to a given Q_U) is determined. See subsection 106-1.03.
7. P_L (percent within the lower specification limit which corresponds to a given Q_L) is determined. See subsection 106-1.03.
8. The Quality Level (the total percent within specification limits) is determined for aggregate gradation, asphalt cement content, and density.

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

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

$$\text{CPF} = \frac{[f_{3/4 \text{ inch}} (\text{PF}_{3/4 \text{ inch}}) + f_{1/2 \text{ inch}} (\text{PF}_{1/2 \text{ inch}}) + \dots f_{ac} (\text{PF}_{ac})]}{\Sigma f}$$

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:

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

* CPF or DPF, whichever is lower.

PAB = Price Adjustment Base = \$43/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)								Reject or Engr Eval
		0	0.04	0.05	0.06	0.07	0.08	0.1	0.25	
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	>1.076
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

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PRF = Pay Reduction Factor from Table 401-4

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

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

The total Asphalt Price Adjustment is the sum of all the price adjustments for each lot plus the longitudinal joint price adjustment:

Deleted

EVALUATION OF LONGITUDINAL JOINT DENSITY.

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

1. If project average joint density is less than 91 % MSG, apply the following disincentive:
$$\text{Deduct} = (\$1.00 \text{ per lineal foot}) \times (\text{lineal feet of paved joint for the entire project}) \times (91 \text{ percent} - \text{Project Average Joint Density percent}) \times 100$$

(Note: convert percent to decimals in this equation)

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

401-5.01 BASIS OF PAYMENT. *Deleted*****

Anti stripping additives and crack sealing (subsection 401-3.07) are subsidiary to the asphalt concrete pavement unless specified as pay items.

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

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

Price adjustments will not apply to:

1. Asphalt Concrete Mixture for leveling course
2. Temporary Pavement

Payment for furnishing and installing joint adhesive and sealing the pavement adjacent to the joints will be paid as 401(9) Longitudinal Joint Adhesive and Sealing.

Payment will be made under:

<u>Pay Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
401(1A)	Asphalt Concrete, Type II, Class A, PG 52-28	Ton
401(1B)	Asphalt Concrete, Type II, Class A, PG 64-28	Ton
401(2A)	Asphalt Cement, PG 52-28	Ton
401(2B)	Asphalt Cement, PG 64-28	Ton

*****Deleted*****

*****Deleted*****

401(6)	Asphalt Price Adjustment	Contingent Sum
401(9)	Longitudinal Joint Adhesive and Sealing	Linear Foot

Deleted
(12/28/04)R199USC04

SECTION 504
STEEL STRUCTURES
CONSTRUCTION REQUIREMENTS

Special Provision

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

- e. Name and qualifications of NDE technicians.

SECTION 603

CULVERTS AND STORM DRAINS

Special Provisions

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

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

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

Add the following Subsection:

603-3.06 CULVERT MARKER POSTS. Culvert marker posts shall be installed on the approach side of storm drain outfalls 30 inches and smaller, field inlets not in paved parking lots, all end sections to cross culverts, or as directed by the Engineer. Forty-two (42) inches of post shall remain above the ground after driving.

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

603-5.01 BASIS OF PAYMENT. Add the following: Culvert marker posts will not be paid for directly, but will be subsidiary to pipe items. (8/27/03)R42 USC

SECTION 604

MANHOLES AND INLETS

Special Provisions

604-1.01 DESCRIPTION. Add the following: This work also consists of constructing cleanout structures in conformance with the Plans.

604-3.01 CONSTRUCTION REQUIREMENTS. Add the following after the 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.

604-4.01 METHOD OF MEASUREMENT. Add the following: Frames, grates and lids will not be measured for payment.

604-5.01 BASIS OF PAYMENT. Add the following: Frames, grates and lids are subsidiary to the drainage structure. (02/28/05)R43USC04

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

Pay Item No.	Pay Item	Pay Unit
604(1)	Storm Drain Manhole, Type 1	Each

SECTION 608

SIDEWALKS

Special Provisions

608-1.01 DESCRIPTION. Add the following: This work also consists of constructing asphalt pathway(s) and median(s), and concrete landings with detectable warning tiles, in conformance with the Plans.

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

2. Asphalt Sidewalk and Asphalt Pathway

Asphalt Cement, PG52-28

Subsection 702-2.01

Aggregate, Type II or III

Subsection 703-2.04

Mix Design Requirements (ATM T-17)

Marshall Stability, pounds, min.

1,000

Percent Voids, Total Mix

2-5

Compaction, Blows/side

50

(2/1/00)R47USC

Standard Modifications

608-3.03 CURB RAMPS. Delete subsection and replace with the following: Construct curb ramps according to the details and 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 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 either molded in place epoxy systems, or remove the ramp and replace it with new concrete and integrally attached tactile tile, when retro-fitting existing cured concrete ramps. Install tile so there are no vertical changes in grade exceeding 0.25 inches or horizontal gaps exceeding 0.5 inches. Align pattern on a square grid in the predominate direction of travel. Detectable warnings are made of composite materials, safety yellow color, slip resistant, with truncated dome pattern.

Detectable warnings shall be manufactured and installed according to the Americans with Disabilities Act Accessible Guideline. E20(06/30/04)

Special Provisions

Add following Subsection:

608-3.05 ASPHALT PATHWAYS AND MEDIANS. Construct asphalt pathways and medians according to subsection 608-3.02, Asphalt Sidewalk.

Standard Modifications

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

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

Special Provisions

Add the following:

Asphalt Pathways and Medians. By the ton of asphalt concrete according to Section 109, Measurement and Payment. Asphalt cement will not be measured for payment. Additional asphalt pavement used for matching existing surfaces such as paved parking lots behind a new sidewalk/pathway will be measured and paid under this Section. (2/1/00)R47USC

608-5.01 BASIS OF PAYMENT. Add the following: Asphalt cement for Asphalt Pathways and Medians will not be paid for separately, but will be subsidiary to their respective pay items.

Embankment and bed course materials will be furnished, placed and paid under Sections 203 and 301, respectively. (2/1/00)R47USC

Add the following pay items:

Pay Item No.	Pay Item	Pay Unit
608(8)	Asphalt Pathways and Medians	Ton

SECTION 609

CURBING

Special Provisions

609-3.02 CAST-IN-PLACE CONCRETE CURBING. Add the following to the sixth paragraph: Concrete placed by the extrusion or slip-form process shall have a slump of less than 2 inches. (11/06/02)R202USC02

SECTION 615
STANDARD SIGNS

Special 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 all 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.

Standard Modifications

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

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

(6/30/04)E13

Special Provisions

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

Deliver sign panels, posts and hardware to the State Maintenance Yard located in Palmer, Alaska.

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

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

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

No separate payment for salvaging activities detailed in Subsection 615-3.01, removal of existing sign post foundations, or work required to abandon them in place will be made, but shall be subsidiary to Item 615(6), Salvage Signs. (11/06/02)R50USC02

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

618-3.02 SEEDING SEASONS. Add the following: Seeding shall be performed between May 15 and 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 30 days after seeding using the hydraulic method.

Seed Mix	Component	Ingredients	Application Rate (per MSF)
Type A	Seed	Nortran Tufted Hairgrass Red Fescue (Arctared) Annual Ryegrass (Lolium)	0.50 lbs. 0.40 lbs. <u>0.10 lbs.</u> Total = 1.00 lbs
	Soil Stabilizer Slope \leq 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. The work described under subsection 618-3.01 Soil Preparation is subsidiary to seeding.

Water required for the hydraulic method of application is subsidiary to seeding.
(11/06/02)R52USC

SECTION 620

TOPSOIL

Special Provisions

620-2.05 MATERIALS. Add the following: Provide topsoil of the class specified on the Plans.

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

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 No.	Pay Item	Pay Unit
639(6)	Approach	Each

SECTION 641

EROSION, SEDIMENT, AND POLLUTION CONTROL

Special Provisions

641-1.02 DEFINITIONS.

Item 1. Replace the last sentence with the following: The Department describes common BMPs in its *Alaska Storm Water Pollution Prevention Plan Guide, January 14, 2005*.

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

Standard Modification

641-1.02 DEFINITIONS. Item 6. Delete "7" so sentence reads: Use EPA Form 3510-13. (6/30/04)E15

Special Provisions

641-1.03 SUBMITTALS. Delete this subsection entirely and replace with the following:

For all projects that disturb one (1) acre or more of ground submit three copies each of your SWPPP and HMCP to the Engineer for approval. Submit one (1) copy of your SPCC Plan (if required under Subsection 641-2.03) to the Engineer. Sign all submittals. Deliver these documents to the Engineer no less than five (5) calendar days prior to the preconstruction conference.

The Department will review the SWPPP and HMCP submittals within fourteen (14) calendar days. Submittals will be returned to you as either requiring modification unless 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. You must receive written notification from the Department that your SWPPP has been approved before you submit your original NOI to EPA. NOIs can be submitted by Certified mail or through EPA's electronic NOI system (eNOI).

For regular U.S. Mail delivery:

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

For Overnight/Express mail delivery:

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

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

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

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

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

Once the Department has determined the site has achieved final stabilization, the Engineer will provide written notification to you that your NOT may be submitted to EPA with a copy to the Engineer. The Department will transmit the Department's NOT to the EPA. (02/19/04)E09

SECTION 643

TRAFFIC MAINTENANCE

Special Provisions

643-1.01 DESCRIPTION. Add the following as a third paragraph: Illuminate construction activities listed in Table 643-2 during hours of night work on roads open to the public within project limits. (11/29/04)R276USC04

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

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

Night Work: Work occurring between sunset and sunrise on all days except June 2 through July 13. (11/29/04)R276USC04

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. (08/02/04)R222USC04

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

- i. Supervise lighting of Night Work.

643-1.08 STATIC FIELD LIGHTING TEST. Before work begins, do a static layout of construction and lighting equipment meeting light level requirements in Table 643-2. Tell the Engineer when the test will be conducted. Conduct the test in an area where existing artificial illumination will not increase light readings. Wait until after dark and turn on all lights. The Engineer will measure the minimum horizontal illuminance levels at the locations specified in Table 643-2. In addition, the Engineer or designee will determine whether the system produces too much glare. Modify the system to provide the required illuminance level, uniformity, and glare mitigation.

Take meter readings at roadway surface level.

643-2.01 MATERIALS. Under Item 16. Flagger Paddles, add the following last sentence:

During night work use flagger paddles that meet the criteria of this paragraph, except use reflective sheeting that is "diamond grade" sheeting or approved equivalent.

Add the following:

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

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.

Standard Modification

Add the following:

Immediately notify the Engineer of any traffic related accident that occurs within the project limits as soon as you, an employee, or a subcontractor becomes aware of the accident.
(2/5/04)E10

Special Provision

643-3.02 ROADWAY CHARACTERISTICS DURING CONSTRUCTION. Add the following: Traffic may be maintained on a continuous gravel surface for 14 days.

All slopes within 22 feet from the travel way shall be graded to a 4:1 slope at the end of the work shift.

643-3.03 PUBLIC NOTICE. Add the following: Provide a 24-hour toll free (1-800-###-####) "hotline road report" telephone for the public to access a prerecorded message with weekly notices and daily updates.

Standard Modifications

643-3.04 TRAFFIC CONTROL DEVICES.

In the sixth paragraph, delete the words "ATTSA" and replace with "ATSSA". E16(6/30/04)

Special Provisions

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.

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. (08/02/04)R222USC02

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.

Add the following:

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

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

643-3.06 TRAFFIC PRICE ADJUSTMENT. Add the following: Traffic Price Adjustment will also apply to unacceptable driving conditions, such as severe bumps, "washboarding," potholes, excessive dust or mud, or dirty or out of place traffic control devices. The Engineer will make the sole determination as to whether the roadway or pedestrian facility is acceptable for full unimpeded use by the public. Failure to maintain an acceptable infrastructure or traffic control plan will result in a price adjustment equal to 100 percent of the applicable rate shown in Table 643-1, for the time that the roadway or pedestrian facility is in an unacceptable condition.

Delete Table 643-1 and substitute the following:

**TABLE 643-1
ADJUSTMENT RATES**

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

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

1. Monday through Friday 0530 hours to 0800 hours
Monday through Friday 1600 hours to 1900 hours
2. Around any holiday:
 - a. If a holiday falls on Sunday, Monday or Tuesday, the above stipulations apply from 1200 on the Friday before the holiday to 0300 on the day after the holiday.
 - b. If a holiday falls on Wednesday, the above stipulations apply from 1200 on the Tuesday before the holiday to 0300 on the Thursday after the holiday.
 - c. If a holiday falls on Thursday, Friday or Saturday, the above stipulations apply from 1200 on the day before the holiday to 0300 on the Monday after the holiday.
3. During the Alaska State Fair.

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. (08/02/04)R222USC02

643-3.10 LIGHTING OF NIGHT WORK

Illuminate the night work areas specified in Table 643-2 to the light levels specified.

Table 643-3 does not provide a comprehensive list of operations that require lighting. Provide lighting for other operations when necessary.

Table 643-2 Night Work Illumination Level and Area of Coverage				
Type of Work/ Equipment	Lighting Configuration	Minimum Illumination (footcandles)	Area of Illumination	
			Length (along road)	Width (across road)
Paving, Milling, Striping, Pavement Marking Removal, Rumble Strip Installation	At least 2 machine-mounted balloon lights with a total wattage of at least 4000 watts. Provide additional lights or wattage to meet illumination and area requirements.	5	15' beyond front and back of machine	15' beyond both sides of machine
		1	30' beyond front and back of machine	30' beyond both sides of machine
Rolling, pavement sweeping	At least 4 sealed beam halogen lamps in the front and four in the back. Each should be at least 55 watts.	5	20' beyond front and back of roller	Not specified
Flagging	One light plant with 4 - 1000 watt metal halide lamps illuminating the flagger located within 50' of flagger. Orient to avoid creating glare for drivers.	Not specified	Not specified	Not specified
Truck Crossings (meaning where haul vehicles cross or enter a road): 1) with roads with ADTs over 10,000 or 2) that are controlled by portable signals or flaggers	One light plant with 4 - 1000 watt metal halide lamps located in a manner that will illuminate haul vehicles approaching the crossing. Orient to avoid creating glare for drivers. If it is not possible to illuminate both the flagger and haul vehicles at flagger controlled crossings, provide an additional light plant of the same type.	Not specified	Not specified	Not specified

When Table 643-2 gives the option of balloon lights or light plants, use balloon lights where possible – they provide uniform light with minimal glare.

The Engineer may verify illuminance levels and uniformity at any time using a handheld light meter.

Install lighting in a manner that minimizes glare for motorists, workers, and annoyance or discomfort for residents living along the roadway. Locate, aim, louver, and/or shield light sources to achieve this goal.

The Engineer shall be the sole judge of when glare is unacceptable, either for traffic or for adjoining residences. When notified of unacceptable glare, modify the lighting system to eliminate it.

If the Contractor fails to meet required illuminance levels or provides lighting that creates unacceptable glare at any time, the Contractor shall cease nighttime operations in that area until the condition is corrected.

Lighting equipment shall be in good operating condition and in compliance with applicable OSHA, NEC, and NEMA codes.

Provide suitable brackets and hardware to mount lighting fixtures and generators on machines and equipment. Design mountings so lights can be aimed and positioned as necessary to reduce glare and to provide the required illuminance. Locate mounting brackets and fixtures so they don't interfere with the equipment operator or overhead structures. Connect fixtures securely in a manner that minimizes vibration.

Ground, trailer, and equipment-mounted light towers shall be sturdy and freestanding without the aid of guy wires. Towers shall be capable of being moved to keep pace with the construction operation. Position ground and trailer-mounted towers and trailers to minimize the risk of being impacted by traffic on the roadway or by construction traffic or equipment.

Ensure that trailer or equipment mounted light towers do not exceed the height of overhead objects such as trees, aerial utilities, or bridges. Aim and adjust lights to provide the required light levels. Provide uniform illumination on the hopper, auger, and screed areas of pavers. Illuminate the operator's controls on machines uniformly.

Conventional vehicle headlights do not eliminate the need for the Contractor to provide lighting. Furnish each side of non-street legal equipment with a minimum of 75 square inches high intensity retroreflective sheeting in each corner, so at least 150 square inches of sheeting is visible from each direction.

Existing street and highway lighting do not eliminate the need for the Contractor to provide lighting.

Provide sufficient fuel, spare lamps, spare generators, and qualified personnel to ensure that required lights operate continuously during nighttime operations. Ensure generators have fuel tanks of sufficient capacity to permit operation of the lighting system for a minimum of 12 hours.

In the event of failure of the lighting system, discontinue the operation until the required level and quality of illumination is restored.

Maintain a supply of emergency flares for use in the event of emergency or unanticipated situations.

Provide NCHRP 350-compliant breakaway bases for post-mounted electroliers located within the clear zone. (11/29/04)R276USC04

Standard Modifications

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.

643-4.01 METHOD OF MEASUREMENT. Add the following:

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

Special Provisions

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:

16. Work Zone Illumination. Payment for work zone illumination is subsidiary to other items. (11/29/04)R276USC04

Add the following: The Engineer does not require a change order/directive for Item 643(25) Traffic Control. (08/02/04)R222USC02

TRAFFIC CONTROL RATE SCHEDULE

Traffic Control Device	Pay Unit	Unit Rate
Construction Signs	Each/Day	\$5.00
Special Construction Sign	Square Foot	\$20.00
Type II Barricade	Each/Day	\$ 3.00
Type III Barricade	Each/Day	\$ 10.00
Traffic Cone or Tubular Marker	Each/Day	\$ 1.00
Drums	Each/Day	\$ 3.00
Sequential Arrow Panel	Each/Day	\$55.00
Portable Concrete Barrier	Each	\$60.00
Temporary Crash Cushion / ET-2000 LET	Each	\$3,000.00
Pilot Car	Hour	\$65.00
Watering	M-Gallon	\$ 20.00
Street Sweeping	Hour	\$150.00
Power Broom	Hour	\$75.00
Plastic Safety Fence	Foot	\$2.50

Portable Changeable Message Board Sign	Calendar Day	\$150.00
Temporary Sidewalk Surfacing	Square Foot	\$1.15
Flexible Markers	Each	\$50.00
Removal of Pavement Markings	Foot	\$1.25
Temporary Guardrail	Foot	\$21.00
Interim Pavement Markings		
Painted Markings	Foot	\$0.30
Removable Preformed Markings	Foot	\$0.65
Temporary Raised Pavement Markings	Each	\$0.75
Word or Symbol Markings	Each	\$40.00

The Engineer will pay for Item 643(15), Flagging on a contingent sum basis at the rate of \$36.00/hour. The Engineer does not require a change order/directive for the flagging pay item. Flagging associated with Change Order work will be paid at the prices agreed to in the Change Order, or on a time and materials basis according to subsection 109-1.05.

Delete Item 643(15) and substitute the following:

Pay Item No.	Pay Item	Pay Unit
643(15)	Flagging	Contingent Sum

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 2 weeks before beginning work, through 30 days after issuance of the notice of project completion as defined in subsection 105-1.15. The following office requirements shall be met:

1. A minimum of 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 6 electrical outlets.
4. A minimum of 100 square feet of window area and adequate ventilation.
5. Adequate parking for a minimum of 16 vehicles, with one disability parking space meeting the requirements of Americans with Disabilities Act Accessibility Guidelines (ADAAG). The Engineer's office shall be accessible by the disability parking.
6. Attached indoor plumbing with sanitary lavatory facilities and potable drinking water.
7. Four telephone service lines available at the office location.
8. If a part of the Contractor's building, it shall be completely partitioned off from the balance of the structure and provided with a separate outside door equipped with a lock.
9. Located within 3 miles of the project.
10. Weekly janitorial service consisting of emptying trash receptacles, vacuuming office area and cleaning restrooms and counter areas.
11. Provide one mobilization and one demobilization of the Engineer's office equipment and furniture, from Anchorage.

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 fourteen (14) days to review the initial CPM Schedule. Revise promptly. The finalized CPM Schedule must be completed and accepted before beginning work on the Project.

646-3.01 REQUIREMENTS AND USE OF SCHEDULE.

Delete item 2. 60-Day Preliminary Schedule.

Delete the first sentence of item 3. Schedule Updates. and substitute the following: Hold job site progress meetings with the Engineer for the purpose of updating the CPM Schedule. Meet with the Engineer monthly or as deemed necessary by the Engineer. (12/13/02)R261M98

Add the following Section:

SECTION 647

EQUIPMENT RENTAL

Special 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 hand tools, power tools, electric power generators, welders, small air compressors and other shop equipment needed for maintenance of the construction equipment.

The Engineer will provide direction to the Contractor's supervisory personnel only, not to the operators or laborers. In no case shall direction 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, 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 kinds, sizes, capacities, and other requirements set forth shall be understood to be minimum requirements. The number of pieces of equipment to be furnished and used shall be, as the Engineer considers necessary for economical and expeditious performance of the work. The equipment shall be used only at such times and places as the Engineer may direct.

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

Equipment shall be fully operated, which shall be understood to include the operators, oilers, tenders, fuel, oil, air hose, lubrication, repairs, maintenance, insurance, and incidental items and expenses.

647-2.02 EQUIPMENT OPERATORS AND SUPERVISION PERSONNEL. Equipment operators shall be competent and experienced and shall be capable of operating the equipment to its capacity. Personnel furnished by the Contractor shall be, and shall remain during the work hereunder, employees solely of the Contractor.

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.

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

Furnish equipment, tools, labor, and materials in the kinds, number, and at times directed by the Engineer and shall begin, continue, and stop the 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, six 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 is actually engaged in the performance of work in the designated areas according to the direction of the Engineer. The pay time will not include idle periods, time used in oiling, servicing, or repairing of equipment, or in making changeovers of parts to the equipment. Travel time to or from the work site project will not be authorized for payment.

647-5.01 BASIS OF PAYMENT. Payment for Item 647(2) Wide Pad Dozer, 65-HP Minimum will be paid at the contract price for the number of hours required to complete the work according to the engineers direction. This shall be full compensation for furnishing, operating, maintaining, servicing and repairing the equipment, and for 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 extra compensation. (02/25/05)R15USC

Payment will be made under:

Pay Item No.	Pay Item	Pay Unit
647(2)	Wide Pad Dozer, 65-HP Minimum	Hour

SECTION 660

SIGNALS AND LIGHTING

Special Provisions

660-2.01 MATERIALS. Delete the requirement for "Steel Pipe Pile" and substitute the following:

Steel Pipe Pile Grade X42 steel pipe conforming to API 5L

1. Equipment List(s) and Drawings. Delete item a in its entirety and the last sentence in item d and substitute the following:
 - a. Materials on the *Approved Products List*: The Approved Products List does not apply to the 660 items. Provide catalog cuts of materials to the Engineer for review and approval.
 - d. Materials Not Requiring Certification: Only submit these materials for review and approval if they are included on the Materials Certification List (MCL).
2. As-Built Plans. Add the following:

The Engineer will deliver one copy each to State Maintenance and Operations; Technical Services; and attach the appropriate sheets of the last set in clear plastic envelopes to the inside of each controller assembly and load center.

CONSTRUCTION REQUIREMENTS

Special Provisions

660-3.01 GENERAL. Delete items 3 through 8 in their entirety and substitute the following:

3. Excavating and Backfilling. Complete excavation and backfill required to install the signal and lighting components embedded in the roadway as shown in the Plans, including foundations, conduits, junction boxes, and loop detectors. Complete this work according to the requirements of Section 643. Place excavated materials where it will not interfere with surface drainage.

Support and protect conduits and utilities scheduled to remain in service when encountering them during excavation.

Excavate trenches wide enough to install the number of conduits specified side by side, to provide clearances of at least 2½ inches around 2 inch conduits and at least 2 inches around conduits larger than 2 inches, and to compact the bedding and backfill materials according to these specifications.

To install conduits, excavate trenches deep enough to allow for 6 inches of bedding material, the depth of the largest conduit, and the minimum burial depth specified

between the top of the conduit and finished grade of the ground above the conduit. Keep the longitudinal profile of trench bottoms free of irregularities that would prevent the assembled conduit run from continuously contacting the top of the bedding material.

Dispose of, according to subsection 203-3.01, excavated materials that remain after completing backfill work and excavated material not meeting the requirements of Selected Material, Type C, as defined in subsection 703-2.07.

Dewater excavations immediately before and during embedding and backfilling operations. Backfill excavations with materials that meet the following requirements:

- a. Around formed foundations and the tops of pipe pile foundations, use material that meets the requirements of Selected Material, Type A that passes through a 3 inch sieve,
- b. Within the limits of the typical section, embed conduits and backfill trenches using material that meets the requirements of the lift where it is located, reusing excavated materials if it meets the requirements of the applicable lift,
- c. In other locations, embed conduits and backfill trenches using material that meets the requirements of Selected Material, Type C, reusing excavated materials if it meets this requirement.
- d. Import, when ordered, embedment and backfill materials that satisfy the preceding materials requirements.

Embed conduit(s) between two 6 inch lifts of material gleaned free of rocks exceeding a 1 inch maximum dimension. Grade and compact the first lift to provide a surface that continuously contacts the assembled conduit run.

Within 6 feet of paved surfaces and around foundations, backfill in uniform layers no more than 6 inches deep and compact each layer according to subsection 203-3.04. In other locations, compaction may be as approved by the Engineer.

4. Welding. Complete welding according to subsection 504-3.01.8. Welding and approved shop drawings.

Submit shop drawings of the proposed work with the welding plans for approval. The shop drawings shall include material specifications, component dimensions, the types of welds that will be made, and the proposed type and extent of weld inspection.

Repair the holes, which were used to mount equipment, in reused poles and mast arms by welding in disks flush with the adjoining surface. For the disk material, use steel that matches the ASTM designation, grade, and thickness of the steel used to fabricate each pole. Cut disks that match the dimensions of the hole being repaired from pieces of steel plate bent to match the pole's radius at the hole. Grind the welds smooth and flush with

the adjoining pole and disk surfaces. Repair the damaged finish according to subsection 660-3.01.8.

5. Removing and Replacing Improvements. The Contractor shall complete the following work at the Contractor's expense:

- a. Remove improvements that block completion of the work detailed in the Plans as specified herein.
- b. Reconstruct with new materials the nonreusable improvements the Contractor removed to complete the work, the repairs that are not covered by other items in the contract.
- c. Replace with new materials the reusable items damaged by the Contractor, that are specified for reuse.
- d. Reconstruct with new materials improvements that the Contractor damaged or removed, that 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 installation. Crushed aggregate base material may not be used as backfill in the base course if excavation depth exceeds the thickness of the base course.

Complete 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 removing 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 4 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 and Reusing Electrical Equipment. When the Plans include existing electrical equipment scheduled for removal or relocation, remove and store the equipment listed in the following paragraph without damaging it. Deliver removed equipment not scheduled for reuse to the nearest District Maintenance Station or place specified in the Plans or Special Provisions. Notify the district superintendent or person specified by telephone one-week before planned delivery date.

Salvage the controller assemblies, signal heads, mounting brackets, luminaires, lighting standards, signal posts and poles, mast arms, optical detectors, load centers, light emitting diode optical units, and the lids of junction boxes scheduled for removal and other materials scheduled for relocation. The Contractor shall replace at the Contractor's expense salvaged equipment damaged or destroyed before or during delivery or reinstallation.

Controller assemblies and load centers include the cabinet and equipment contained in the cabinet before Contract award.

Remove from the highway right-of-way materials associated with the equipment removed or relocated and not scheduled for reuse, including conduits, junction boxes, conductors, and foundations. Raze the tops of foundations abandoned in place according to subsection 660-3.02. Fill the holes left by removing junction boxes and foundations with selected material type A and compact as directed.

With approval, after removing conductors, buried conduits that do not interfere with other construction may be abandoned in place with a credit taken by the Department. Remove the ends of abandoned conduits from the junction boxes that will remain in service.

Within 15 days of the Notice to Proceed, complete an inventory of the materials that will be salvaged in the presence of the Engineer. Note the location and condition of the materials. When material specified for reuse is found in an unserviceable condition, the Engineer will determine whether to repair it or replace it with new material, which will be paid for as extra work under subsection 109-1.05. Retain a copy of the inventory and give the original documents to the Engineer.

When the Plans specify reinstalling existing equipment at new locations and installing State furnished equipment, complete the following work at the Contractor's expense:

- a. For poles, install new foundations, furnishing the new nuts, bolts, washers, and conduits needed to complete the installations.
- b. For lighting poles, install new illumination tap wires and fused disconnect kits.
- c. For luminaires, clean the luminaires inside and out and install new lamps of the same wattage.

- d. For signal heads, furnish and install the mounting brackets needed to complete the relocation, and clean the signal heads inside and out.
- e. For poles and undisturbed poles from which the Plans specify removing equipment, repair the holes that were made to mount equipment according to subsection 660-3.01.4. Welding and repair the finishes according to subsection 660-3.01.8.

When ordered, the Engineer will pay for repairing damaged finishes on existing equipment according to subsection 660-3.01.8 as extra work.

If deciding to use new equipment rather than reusing the equipment specified, notify the Engineer of the change and include a submittal according to subsection 660-2.01.1.

7. Field Tests. 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 test results and give the original documents to the Engineer. Furnish equipment needed to perform these tests.

Replace or repair at the Contractor's expense, and in an approved manner, faulty materials and work revealed by these tests. After making repairs, repeat tests on the repaired circuit and continue this process until circuits have passed required tests. The Department reserves the right to have the Contractor retest circuits, and to use the retest results to accept or reject individual circuits.

- a. Grounds. Before completing the circuitry and functional tests, physically examine conduits ends, junction box lids, load centers, and the foundations for signal posts and poles, lighting poles, and controller cabinets to ensure the grounding system required by subsections 660-3.06 and 661-3.01 has been installed and splices and connections are mechanically firm.
- b. Continuity. Test each loop detector circuit for continuity at the roadside junction box before splicing the loop detector to the lead in cable. Each loop detector must have a resistance less than 0.5 ohms.

After splicing the loop detectors to the lead in cables, test each pair at the controller or detector cabinet. Each pair must have a value less than 5 ohms for single pair lead in cables and 10 ohms for multipair lead in cables. The continuity test ohm reading at the cabinet must be greater than the ohm reading measured for the loop detector at the junction box.

- c. Insulation Resistance (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 multiconductor cable, complete the test between conductors and between each conductor and ground.

After splicing the loops to the shielded pairs in the lead in cables, measure each pair in the lead in cables at the controller or detector cabinet between one conductor and the cabinet ground rod.

- d. Inductance Test. Measure each detector loop and lead in cable system at the controller or detector cabinet. The inductance must be in the range of 50 to 500 microhenries.
- e. Circuit. Energize every signal indication circuit with lamps installed before installing the load switches. Signal heads are to be covered at all times with commercial hooded covers manufactured to cover signal heads until all functional tests are complete. Covers shall have semi-transparent faces that allow energizing tests to be completed without removing the commercial covers. Commercial covers are to be approved by the Engineer prior to use.
- f. Functional. Perform the following tests on each signal and lighting system after the component circuits have satisfactorily passed the tests for continuity, grounding, insulation integrity, and circuitry.

- 1) For each new traffic signal system, complete at least 24 hours of flashing operation, followed by not less than 5 days of continuous, satisfactory operation. The Engineer may decide to omit the flashing portion of the test for modified signal systems and for new signals that replaced existing signals that remained in operation during the construction phase.

If the Engineer omits flashing operation and the system performs unsatisfactorily, correct the condition and repeat the test until the system runs for five days with continuous, satisfactory operation.

Begin the signal functional tests between 9:00 a.m. and 2:00 p.m. on any day, except a Friday, Saturday, Sunday, a legal holiday, or the day before the legal holiday.

Before each system turn on, aim signal faces according to subsection 660-3.08 and ensure equipment specified in the Plans is installed and operable, including: pedestrian signals and push buttons; signal backplates and visors; vehicle detectors; highway lighting; and regulatory, warning, and guide signs.

- 2) Perform the functional test for each highway lighting system and sign illumination system until the systems burn continuously 5 days without the photocell, followed by a 5 day operational test using the photocell.

- 3) Perform the functional test for each flashing beacon system for not less than 5 days of continuous, satisfactory operation.
- 4) Perform a continuous 5 day burning test on each pedestrian overpass and underpass lighting system before final acceptance.

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 putting 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 pretreatment, vinyl wash primer, followed by 2 prime coats of zinc chromate primer for metal.
- (4) Give signal equipment, excluding standards, a spot finishing coat on newly primed areas, followed by 1 finishing coat over the entire surface.
- (5) Give nongalvanized 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 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 traffic signal post and 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 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"

Delete item k and add the following new items k and l:

- k. Install the bottoms of the bottom leveling nuts in a level plane within 1 inch of the top of foundations. Generously lubricate the bearing surface and internal threads of top nuts with beeswax and tighten the top nuts according to the anchor bolt tightening procedure included in the subsection 660-3.08.5 High Tower Lighting System Installation.
 - 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 when the Plans specify using polyethylene

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 both rigid metal and polyethylene 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 at all times. 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 $1\frac{1}{4}$ 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 polyethylene 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. 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 or a single cable other than signal interconnect.
3. 190 feet for conduits that contain more cables than those listed in the two preceding limitations.
4. 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 conductors 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 ¼ 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.

660-3.07 TRAFFIC CONTROLLER ASSEMBLIES. Add the following: Provide a traffic signal system with the Opticom Priority Control System, Traffic Logging System, Traffic Management Communication System and Portable Signal Controller Tester as specified in Subsection 740-2.13. In addition, provide an additional signal controller to the Engineer to be used for training, diagnosis, and testing of signal timing plans.

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 below for the high tower poles.

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 1/2" 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.

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 system 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

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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 an existing 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.

Add the following subsection:

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capable of properly mixing at the point and time of application and approved by the manufacturer for the type of product being installed.

For longitudinal markings, legends, symbols and transverse markings use manual or automatic application equipment. Use mechanical bead dispensers to uniformly apply the top coat of beads. Stencils or extruders are required to form sharply defined markings

- (1) Longitudinal Markings Surface Applied. Apply markings for lane lines, edge lines, and centerlines to yield a thickness of 60 mils as measured from the surface of the pavement. Use Type C material, as specified in subsection 712-2.17.
 - (2) Transverse Markings Surface Applied. Apply markings for onlays, arrows, stop bars, gore stripes, railroad symbols and cross walks to yield a thickness of 125 mils as measured from the surface of the pavement. Use Type C material, as specified in subsection 712-2.17.
- f. Disposal of Waste. Waste material becomes the Contractor's property. This includes grindings and removed marking material. Do not dispose of or store stripe removal wastes material or asphalt grindings on State property. Dispose of waste material according to applicable Federal, State, and local regulations.
- g. Sampling. Record the following readings, and the locations where they were taken, and submit them to the Engineer within 24 hours for evaluation. Thickness of material is measured from the surface of the pavement.

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

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

Inspect the markings initially, and again two weeks after placement, to ensure the material has cured properly. Remove soft spots or abnormally darkened areas and replace with material meeting specifications.

Measure the retroreflecivity of each transverse marking at three locations, and of each line at intervals not to exceed 500 feet. Take these measurements using a Delta LTL2000 Retrometer, a 100 foot retro-reflectometer, or approved similar device. Perform testing within 72-hours of curing.

The Engineer may elect to use the Contractors readings or perform additional sampling.

670-3.06 TOLERANCES FOR LANE STRIPING. Delete this subsection in its entirety and replace with the following:

1. Length of Stripe. ± 2 inches.
2. Width of Stripe. $\pm 1/8$ inch.

3. Lane Width. \pm 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. \pm 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 and not uniform.
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.

670-5.01 BASIS OF PAYMENT. Add the following: There will be no separate or additional payment for the following:

- Over-runs of material caused by the variation of the gradation of the asphalt.
- Additional material required to achieve the thickness specified on open-graded pavement.

Milling for installation of the inlaid markings is subsidiary to other items. Payment includes costs associated with this item, including the removal of millings. Item 670(10) includes full compensation for resources required to perform the work according to the Plans and Specifications. No separate payment shall be made for over-runs of material caused by the variation of the gradation of the asphalt or for additional material required to achieve the thickness specified on open-graded pavement. (08/10/04)R246USC04

SECTION 703

ADDENDUM No. 2
ATTACHMENT No. 2

AGGREGATES

Special Provisions

703-2.03 AGGREGATE FOR BASE AND SURFACE COURSE. 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
⅜ 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

(6/22/04)R117USC

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 all natural fines passing a No. 4 sieve before crushing aggregates for Type V asphalt concrete mixture. Free from clay balls, organic matter, and other deleterious material. Not coated with dirt or other finely divided mineral matter. Meet the following requirements:

	TEST	Type IIA, IV	Type IIB, III	Type V
LA Wear, % max	AASHTO T 96	45	45	45
Degradation Value, min	ATM 313	30	30	30
Sodium Sulfate Loss % max (5 cycles)	AASHTO T 104	9	9	9
Fracture, min %	WAQTC FOP for AASHTO TP61	90,2- face	80, 1-face	100, 2-face
Thin-Elongated Pieces, max % 5:1 3:1	ATM 306	8 20	8 -	5 15
Nordic Abrasion, max. %	ATM 312			12
Absorption, max. %	AASHTO T85	2.0		2.0

(12/28/04)R199USC04

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
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

(12/28/04)R199USC04

Fine Aggregate (passing the #4 or 4.75 mm sieve). For Type IV and V mixes, remove all natural fines passing a #4 or 4.75 sieve before crushing aggregates for this asphalt concrete mixture.

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Project No. IM-OA1-6(33)/57871

Consist entirely of aggregate produced from aggregate crushing process and be non-plastic as determined by WAQTC FOP for AASHTO T 90. Meet the quality requirements of AASHTO M 29, including S1.1, Sulfate Soundness. (12/28/04)R199USC04

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

712-2.17 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 after sub-item j:

k. Adhesion: To Portland Cement, minimum 13.8 MPa, to asphalt, dependent on tensile failure of the substrate. (07/17/03)R246M98

l. Color: Yellow, PR-1 chart, 33538 Federal Yellow. White, minimum daylight reflectance of 84.

712-2.18 GLASS BEADS FOR METHYL METHACRYLATE PAVEMENT MARKINGS.

Delete the bead table and substitute the following: Use the type and amount of beads specified

in writing by the marking material manufacturer necessary to meet the performance requirements. (08/10/04)R246USC04

SECTION 724

SEED

Special Provisions

724-2-02. MATERIALS. Delete Table 724-1 and substitute the following:

TABLE 724-1

SEED REQUIREMENTS

SPECIES	Sproutable Seed*, %, Min.
Arctared Red Fescue	78
Egan American Sloughgrass	67
Norcoast Bering Hairgrass	71
Nortran Tufted Hairgrass	71
Wainwright Slender Wheatgrass	88
Alyeska Polargrass	71
Bluejoint	71
Tilesy Sagebrush	71
Tundra Glaucous Bluegrass	76
Gruening Alpine Bluegrass	72
Nugget Kentucky Bluegrass	76
Beach Wildrye	70
Annual Ryegrass	76
Perennial Ryegrass	76

* Sproutable Seed is the mathematical product of Germination and Purity.
(11/06/02)R52USC

SECTION 726

TOPSOIL

Special Provisions

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

2. Contain between 10 percent and 40 percent organic matter as determined by loss-on-ignition of oven dried samples according to ATM 203.

(02/25/05)R139USC

Delete the Table for Grading Requirements in item 3 and substitute the following:

TOPSOIL REQUIREMENTS

REQUIREMENT	CLASS A
Sieve Designation	Percent Passing
3 inch	-
½ inch	100
No. 4	95-100
No. 16	64-90
No. 200	30-60

SECTION 727

SOIL STABILIZATION MATERIAL

Special Provisions

727-2.01 MULCH. Delete numbered item 1. in its entirety and substitute the following:

1. Virgin/Recycled Wood Fiber, Recycled Paper ("wood cellulose") Mulch, or a Blend of Virgin/Recycled Wood Fiber with Recycled Paper Mulch. Blended mulch may contain up to 50 percent recycled paper. The mulch shall meet the following requirements:
 - a. Contains no growth or germination inhibiting factors.
 - b. Will remain in uniform suspension in water under agitation and will blend with grass seed, fertilizer, and other additives to form homogeneous slurry.
 - c. Mulch can be applied uniformly on the soil surface.
 - d. Will not create a hard crust upon drying and have moisture absorption and retention properties and the ability to hold grass seed in contact with the soil.
 - e. Dyed a suitable color to facilitate inspection of its placement.

Ship the mulch material in packages of uniform weight (plus or minus 5 percent) and bear the name of the manufacturer and the air-dry weight content.

Use a commercial tackifier on all areas steeper than 3:1. Use the amount recommended by the manufacturer.

(08/19/99)R206M98

SECTION 730
SIGN 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.

1. Design. Design and fabricate highway lighting and traffic signal structures with pole shaft lengths to 55 feet long to conform to the 1994 Edition of AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals* with interim revisions.

A registered professional engineer shall design the structures and provide stamped shop drawings and calculations. Submit the stamped drawings and calculations for each pole to the Engineer for approval. Design for stresses on the completed structure with hardware in place.

- a. 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.
- b. 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 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.

2. Fabrication. 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 downstream of traffic flow.

Furnish poles and mast arms up to 40 feet long in one piece. Poles and mast arms longer than 40 feet may be furnished in one piece or in two segments with a slip type field splice. For slip type joints, provide a minimum overlap of two feet or 1.5 times the inside diameter of the female section whichever is larger. In mast arms, locate these splices at least one foot

away from the Plan location of signal heads and signs. In signal poles, locate the edge of the female section at least 6 inches above the top of the signal mast arm connection.

Fabricate tubes with walls up to ½ inch thick from the prequalified base metals listed in AWS D1.1 and which feature maximum yield strengths of 70,000 psi. Fabricate elements greater than ½ inch thick from steel that conforms to ASTM A 709 and meets the Fracture Critical Impact Test requirements for zone 3. The Department will not accept structures that contain or are made with laminated steel elements.

Fabricate each tube from no more than 2 pieces of steel. When using 2 pieces, place the longitudinal welded seams directly opposite one another. Place the welded seams on adjacent sections to form continuous straight seams from the base to the top of the pole.

When tenons are needed to install traffic signals and luminaires, make them from two inch nominal schedule 40 pipe that conforms to ASTM A 53 Grade B.

Fabricate 10 feet long signal posts from 11 US Standard Gage sheet steel. Fabricate each post with a minimum inside diameter of five inches at the base plate. Use a 3½-inch long piece of four inch nominal schedule 40 pipe that conforms to ASTM A 53 Grade B as a post-top adapter.

The Department does not allow holes made for lifting purposes in the ends of tubular segments, except in the free ends of luminaire mast arms. To add lift points, weld them to the tube opposite the longitudinal seam weld on the outside of female segments and on the inside of male segments. Before shipment, remove 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. Lift points added to the inside of tubes in place may be left in place.

Hot dip galvanize lighting and signal structures to meet AASHTO M 111 and these specifications. Completely submerge pole and mast arm segments in one dip in a kettle of concentrated zinc ammonium chloride flux solution heated to 130 oF, then completely submerge in one dip in a separate kettle of prime western grade zinc heated to approximately 825 oF. 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:

- a. Not fabricated according to these specifications or the approved shop drawings,
- b. Bowed with sweeps exceeding ¾ inch throughout the length of the pole, mast arm, or segment, if furnishing a 2 piece pole or mast arm,

- c. Out of round. Sections are out of round when the diameters of round members or the dimension across the flats of multisided members exceed 2 percent of the dimension specified on the shop drawings.

Fabricate pile cap adapters from grade X42 steel line pipe that conforms to API 5L and from steel plate that conforms to ASTM A 709 Grade 50. Attach the anchor plate to the pile section with a complete joint penetration (CJP) weld. Fabricate the anchor plate to match the base plate of the lighting standard.

- 3. Welding. Perform welding to conform to subsection 504-3.01 8. Welding and the following:
 - a. Make welds continuous.
 - b. Use partial joint penetration (PJP) welds in longitudinal seams. PJP welds must provide at least 60% penetration.
 - c. 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.
 - d. Use socket type joints with two fillet welds to connect base plates to tubes with walls less than 5/16 of an inch thick.
 - e. On steels 5/16 of an inch thick and thicker, inspect 100 Percent of CJP welds by either radiography (RT) or ultrasound (UT).
 - f. 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 according to AWS D1.3.
 - g. Only visually inspect welds made on luminaire mast arms.
- 4. Miscellaneous. 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
 - a. On holes through which electrical conductors pass, provide a 1/16 inch radius on both the entrance and exit edges,
 - b. On pole base plates, provide a 1/8 inch radius on edges along which plate thickness is measured and a smooth finish on all other exposed edges,
 - c. On the ends of 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 6 inches do two things: grind down welds until they feature

a radius concentric with the mating surface and remove material protruding from the two surfaces, and

- d. Grind exposed welds flush with the base metal, except fillet welds and seam welds on top of mast arms. Grinding seam welds on multisided 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 required information using 1/4 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 furnishing a two piece signal mast arm with slip type joint, mark both pieces with the same message.

TABLE 740-1		
POLE MARKINGS		
<i>Note: Italic type indicates additional Tag Markings if poles have 2 luminaire or 2 signal mast arms.</i>		
	MEASUREMENTS	TAG MARKINGS
Signal Poles		
a) Signal mast arm length	45 ft./55 ft.	SMA 45/SMA 55
b) Luminaire mast arm length	22 ft./18 ft.	LMA 22/LMA 18
c) Pole height	36 ft.	PH 36
d) Intersection number (if more than one) -pole number		1 - P 4
e) Sum of signal mast arm moments about centerline of signal pole		SM 4000/SM 3200
f) Design wind speed	100 mph	DWS 100
Light Poles		
a) Luminaire mast arm length	15 ft./15 ft.	LMA 15/LMA 15
b) Pole height	37 ft.	PH 37
Signal Mast Arm		
a) Mast arm length	40 ft.	SMA 40
b) Intersection number (if more than one) -pole number		1 - P 4
c) Sum of signal mast arm moments about centerline of signal pole		SM 3740
d) Design wind speed	100 mph	DWS 100
Luminaire Mast Arm		
a) Mast arm length	18 ft.	LMA 18
b) Pole number (if unique arm design)		P 4

Replace subsection 740-2.06 with the following:

740-2.06 ELECTRICAL CONDUIT AND FITTINGS. Unless specified otherwise, use rigid metal conduit and fittings for raceways. Furnish galvanized rigid type conduit and elbows that conform to UL-6 and are manufactured of mild steel according to ANSI C80.1. Furnish third party certified fittings designed for rigid metal conduit.

For loop detectors, use Schedule 80 polyvinyl chloride (PVC) conduit that conforms to UL-651. Use PVC fittings meeting NEMA TC 3.

When polyethylene conduits are specified in the Plans, use a smooth wall, schedule 40, high-density polyethylene (HDPE) pipe that conforms to UL 651 B.

Furnish insulated throat grounding bushings made of malleable iron or steel with a mechanically galvanized or zinc plated finish. Grounding lugs shall either be an integral part of the bushing or consist of an attached tin plated copper saddle. 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 loop detectors, furnish type X bodies and, 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 $\frac{3}{4}$ inch, angular misalignments in any direction to 30 degrees, and parallel misalignment of the conduits to $\frac{3}{4}$ inch. The fittings shall also include a braided copper bonding jumper equal to an 8 AWG conductor, bushings to prevent scraping the conductors, and a smooth inner sleeve that maintains a constant diameter regardless of conduit alignment.

740-2.11 CONTROLLER CABINET. Add the following to the first paragraph of subpart (1) of subitem c. Cabinet Wiring. of item 1. Standard Features. : Furnish controller cabinets wired to accommodate five 4 channel inductive loop detector units and two 2 channel inductive loop detector units.

Replace bullet (e) of subpart (3) Field Terminal Blocks of subitem c. Cabinet Wiring. of item 1. Standard Features. : On the right side of controller cabinets, install two 16 position bus bars, for terminating the equipment grounding and neutral conductors used inside the cabinets. On the left side of the controller cabinets, install two 32 position bus bars, for terminating the equipment grounding and neutral conductors from field wiring.

740-2.12 STANDARD AUXILIARY EQUIPMENT. Add the following subitem under item 3. Conflict Monitors.:

- d. Whenever the Plans or Special Provisions call for a Traffic Management Communication System, supply conflict monitors with an RS-232 serial port that allows the monitor to download information through an external dial-up multi-port modem or to a personal computer using the Microsoft Windows NT operating system.

740-2.13 SPECIAL AUXILIARY EQUIPMENT. Add the following items:

6. Opticom Priority Control System. Install the following components of the 3M Company's Opticom Priority Control System according to 3M's written installation instructions at the signalized intersections listed on the Plans.

Install the quantity of model 711, 721, and 722 optical detectors on the signal pole mast arms shown on the Plans. Before installing the detectors, gain approval of their final lateral location from the Engineer. See the Plans for installation details.

Install Model 138 Optical detector lead in cable between the end of each signal mast arm and the controller cabinet. Furnish enough slack in these cables for them to extend 2 feet beyond the end of each signal mast arm and to leave 10 feet of slack in the controller cabinet. Seal both ends of each lead in cable with mastic lined, heat shrink tubing end caps.

Before attaching the conductors to the optical detectors, strip the insulation for the conductors and attach four conductors to ground in the controller cabinet. Attach the signal cable to the confirmation light. The Manufacturer's Representative will tie down the conductors in the controller cabinet under Item 660(26) Signal System Timing and Adjustments.

Furnish each controller cabinet with a Model 754 phase selector, a Model 760 card rack, and an Opticom Panel Assembly, U.S. Traffic Corporation part number 103303. The panel assembly interfaces the card rack to the controller cabinet. Furnish new controller assemblies with these parts installed by the controller assembly manufacturer. To retrofit existing controller assemblies, deliver the parts to MOA Signal Maintenance, who will install the parts under Item 660(25) Controller Cabinet Preparation.

7. Traffic Logging System. Furnish, and others will install in the controller cabinet, a stand alone unit that collects, time stamps, and stores data in an unattended manner. The traffic logging system shall conform to the following:
 - a. Operation. The unit shall accept a new operating program, operational parameters, and the date and time stamp from a personal computer, downloaded through an RS-232 cable. The use of replaceable prompts to change the operational program is unacceptable. Data collection shall be automatic and not require an operator to

reset or start operation.

In the event of a power interruption, data collection shall automatically restart at the proper time. Other than, the current sample being collected, the unit shall not lose stored data because of the power interruption. At power up or at the restoration of power after an outage, the unit shall log the date and time at the start of data collection.

The unit shall maintain the operating program, data storage, and date/time for a minimum of 5 years from when power is removed from the unit. The internal program/data size shall be a minimum of 32,000 bytes.

- b. Input Interface. The unit shall have a minimum of 28 inputs. Furnish new and existing controller cabinet only with a loose Detector Systems TLS-1-C1 interface cable to connect the unit to the output of the loop detector units. The Municipality of Anchorage's Signal Maintenance Section will install the interface cable in the controller cabinets under Item 660(26) Signal System Timing and Adjustments. Do not furnish new controller cabinets with a built in interface panel.
 - c. Output Interface. Furnish units with an RS-232 serial port that allows a user to download and upload directly between the unit and a personal computer using the Microsoft Windows NT operating system or the external dial-up multi-port modem.
8. Traffic Management Communication System. Furnish one notebook computer and the traffic management software PCTNET licensed for use by the Central Region Traffic Engineer and the Mat-Su District Signal Maintenance Technician.

Furnish a Windows XP compatible version of PCTNET that works with Traconex TMP390 intersection controllers using J9 revision G firmware and Traconex TMM-500 system controllers using A9 revision B firmware. PCTNET is available locally from North Star Systems.

The notebook computer shall feature:

- a. Microsoft Window XP operating systems
- b. 17-inch displays
- c. 512 megabytes of DDR SDRAM (minimum)
- d. Two 40 gigabyte modular hard drives (minimum size)
- e. Two high capacity lithium ion batteries
- f. Touch pads
- g. External VSB mice
- h. Internal wireless 802.11X networking adapters
- i. Processors that operate at 1.7 gigahertz (minimum)

The software shall support the management of the following microprocessor-base intersection and system controllers:

Traconex[®] TMP-390 Rev. J9B firmware
Traconex[®] TMP-390CJ Rev. V4 firmware
Traconex[®] TMM-500 Rev. A9 firmware
Traconex[®] TMM-500 Rev. C0 firmware

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Windows and Windows XP are registered trademarks of Microsoft Corporation.

9. Portable Signal Controller Tester. Furnish a portable signal controller tester and wiring harness compatible with the controllers being supplied. The tester must be able to test all standard and extended NEMA controller functions by enabling the technician to simulate any controller function and to view indications of controller outputs. Provide the McCain TrafficSupply model NT-12 or equal.

740-2.14 VEHICULAR SIGNAL HEADS. Replace item 4 with the following and add item 5:

4. Backplates. Install backplates around vehicular signal faces except post-mounted flashers. Furnish backplates constructed of 0.063 inch minimum thickness aluminum alloy sheet meeting ASTM B 209, alloy 3003-H14. For those backplates fabricated from 2 or more pieces of sheeting, furnish them fastened together with aluminum rivets or bolts peened after assembly.

For traffic signals that consist of all 8 inch or all 12 inch signal sections, furnish 5 or 5½ inch wide backplates regardless of where the signals are installed, i.e. on mast arms, on top of posts, or on the sides of poles.

For traffic signals that consist of combinations of vertically stacked 8 and 12 inch signal sections, furnish backplates with nominal borders of 8 inch for the 8 inch sections and 5 inch for 12 inch sections.

Furnish backplates with the back and front faces factory finished with 2 coats of dark olive green enamel and 2 coats of flat black enamel, respectively.

5. Signal Mounting Hardware: Furnish elevator plumbizers, elbow pipe fittings, and post top adapters (without a terminal compartment) with integral serrated contacts that feature 72 teeth.

Provide signal heads that will be mounted on mast arms or pipe tenons with ferrous or bronze elevator plumbizers.

For signal faces installed on the sides of poles, furnish signal frames that consist of watertight assemblies of 1½ inch nominal diameter standard steel pipe, malleable iron or brass pipe fittings, and bronze terminal compartments. The side of the terminal compartment opposite the door shall feature a saddle shape for wobble free mounting on round poles and include a cable guide and two holes for mounting the compartment.

Furnish vehicular signal frames with a horizontal dimension between the center of the terminal compartment and the axis of the adjacent signal face of 22 inches in side mounted frames and 11 inches in post top installations.

Post top adapters shall slip fit over 4 inch nominal standard pipe and feature two rows of three cadmium plated steel setscrews. Furnish post top adapters with terminal compartments, except one way signal heads may be installed on adapters without a terminal compartment provided the adapters include offset openings. Provide post top adapters without a terminal compartment made of cast iron.

Furnish terminal compartments with a terminal block containing 12 poles, each with two screw type terminals. Each terminal must accommodate at least three 14 AWG conductors. Provide terminal compartments with a rain tight door that provide ready access to the terminal block.

For mounting each terminal compartment, furnish two ½" x 13 hot dip galvanized bolts that conform to ASTM A 325 and two ½" hot dip galvanized washers that conform to ASTM F 436.

740-2.15 PEDESTRIAN SIGNALS. Add the following as item 12: Furnish pedestrian signals side mounted on poles with a 2 piece, hinge connected, cast aluminum clamshell bracket that mounts directly between the pole and the side of the housing. The bracket shall fit round poles with outside diameters of 4.5 inches and greater without wobbling and allow a minimum rotation of ±15 degrees when mounted on a 4.5 inch O.D. pole. The bracket shall feature a rain-tight terminal compartment and include a 12 position terminal block. Installed, the bracket shall take less than three inches of space between the housing and pole.

For mounting each clamshell bracket, furnish two ½" x 13 hot dip galvanized bolts that conform to ASTM A 325 and two spacers provided by the bracket manufacturer to keep the bolt head clear of the recess that holds the nut in a through bolted installation.

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, unless polycarbonate resin refractors are specified.
4. Terminal blocks for attaching the illumination tap conductors.
5. Aluminum reflectors with an ALZAK or ALGLAS finish.
6. Optical components free of substances that affect photometric performance, e.g. paint.
7. Housings cast with no provision for a photoelectric control receptacle.
8. Airtight reflector and lens units that breathe through activated charcoal filters and include elastomer gaskets to seal the gap between the two components. Gasket material must withstand the temperatures involved and be securely held in place.
9. Plug in starting aids in fixtures with lamps through 400 watts.

Each cobrahead luminaire shall also include:

- An easily removed hinged door used exclusively for mounting the ballast.
- A second door that frames the lens, hinges on the house side, and fastens on the street side with an automatic type latch.
- A four bolt mounting brackets that fit 2 inch nominal diameter standard pipe and feature a center pivot for leveling the luminaire.

Offset luminaires shall also include knuckle style pole top adapters that are sized to fit 2 inch nominal diameter standard pipe and feature a wire way meeting NEC requirements for installing three size 10 AWG conductors between the pole and the terminal block located in the luminaire.

1. High tower luminaire.
 - a. A 1,000 watt, high pressure sodium lamp that provide 140,000 minimum initial lumens.
 - b. A side entry 4 bolt mounting bracket designed for 2 inch nominal diameter pipe with provision for leveling the luminaire.

- c. A die cast aluminum housing attached to the mounting bracket, which provides a weather tight enclosure for the ballast and terminal block and is readily removable without removing the luminaire from the bracket arm.
- d. A cover and reflector that readily detaches from the mounting bracket without removing the luminaire from the bracket arm.
- e. A double fused 480 volt ballast with fuses sized by the luminaire manufacturer.
- f. A hinged lens compatible with add on light shields.
- g. A stainless steel lamp clamp to prevent lamps from loosening, which is separate from the socket.

When the Plans specify shielding areas from illumination, install light shields on all luminaires on all high tower poles whose templates touch the shielded areas. Provide shields that limit light levels to 0.1 footcandle or less at the right of way line. Whenever stock shields fail to limit light levels to the 0.1 footcandle level, hire the luminaire manufacturer to custom design and fabricate shields. If the first generation of custom fabricated shields fail to limit light levels to the 0.1 footcandle level, the Engineer may waive the 0.1 footcandle requirement.

2. Lenses. When polycarbonate resin lenses are specified, furnish lenses the fabricator certifies conforms to the following criteria.
- a. The lenses are molded in a single piece from virgin polycarbonate resin.
 - b. The lenses are free from cracks, blisters, burns, and flow lines, and furnished with the natural molded surface.
 - c. The lenses are of uniform density throughout and free from air, gas, or moisture pockets, and uncured areas.
 - d. The lenses are transparent with a clear bluish tint, produced from ultraviolet stabilized resin to reduce the effects of ultraviolet radiation on their color properties.
 - e. The resins used meet the requirements for the self extinguishing classification of ASTM D 635 and feature a minimum impact strength, Izod notched of 12 foot pounds per inch when tested according to ASTM D 256, Method A, using a 1/8 inch by 1/2 inch bar molded according to ASTM recommended practice.

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