PART 4

STANDARD MODIFICATIONS

AND SPECIAL PROVISIONS

to the STATE OF ALASKA

STANDARD SPECIFICATIONS
FOR
HIGHWAY CONSTRUCTION

2004

SECTION 101

DEFINITIONS AND TERMS

Special Provisions

101-1.03 DEFINITIONS.

BASE COURSE. Delete the definition and replace with the following: One or more layers of specified material placed on a subbase or subgrade to support ATB or a surface course. (ANH 11/15/04)

SECTION 102

BIDDING REQUIREMENTS AND CONDITIONS

Standard Modification

102-1.05 PREPARATION OF BID. Modify the second sentence in the third paragraph, after: "If a bidder is a corporation, the bid must be signed by a corporate officer," add: or agent. . (06/30/04)E18

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

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

SECTION 103

AWARD AND EXECUTION OF CONTRACT

Special Provisions

103-1.03 AWARD OF CONTRACT. Delete the second sentence in the second paragraph and replace with the following: The successful bidder's refusal to sign the Contract or provide the requested documents within the time specified may result in cancellation of the notice of intent to award and forfeiture of the bid security. (ANH 11/15/04)

SECTION 105

CONTROL OF WORK

Special Provisions

105-1.06 UTILITIES. Add the following: The Contractor shall request locates from the utilities having facilities in the area. The Contractor shall use the locate Call Center for the following utilities:

Locate Call Center 800-478-3121 Who will notify the following:
City of Wasilla Enstar Natural Gas Company General Communications Inc. (GCI) Matanuska Electric Association (MEA) Matanuska Telephone Association (MTA)

Clear and grub those areas designated below for relocation. Slope stake highway and pathway cuts and fills in utility relocation areas prior to the start of utility and pipeline appurtenance relocations, so that the extents of proposed relocations can be verified in the field and adjusted if necessary.

Some of the existing utilities and appurtenances are scheduled for relocation as addressed in the following sections. Existing utilities and appurtenances that are not specifically listed below for relocation or abandonment, shall be considered as Contractor work-arounds for bidding purposes.

ENSTAR NATURAL GAS COMPANY

As of November 1, 2005 Enstar has completed the following relocations of their natural gas lines as described below:

- B.O.P –Station 116+25 – Enstar relocated the existing 6" plastic distribution main from Station 110+18, Right, to Station 114+53, Right, outside the proposed slope limits and lowered the existing 6" plastic distribution main in place from Station 114+53, 48' Right, to Station 116+20, 54' Right.

- Station 119+00 – 131+00 – Enstar lowered the existing 6" plastic distribution main in place from Station 119+15, 75' Rt., to Station 119+40, 75' Rt. and from Station 120+00, 78' Rt. to Station 121+00, 70' Rt. Enstar relocated the existing 6" plastic distribution main from Station 121+10, Rt., to Station 131+00, Rt., outside the proposed slope limits along the Rt. side. Enstar lowered the existing 2" plastic lateral main in place from Station 120+20,

290' Lt, to Station 120+40, 230' Lt., and at Station 120+75, 50' Rt. to 66' Rt. All remaining lateral mains and existing services will be cutover from the existing to the relocated main.

- Station 133+00 – 148+00 - Enstar relocated the existing 6" plastic distribution main from Station 133+00, Rt., to Station 148+00, Rt., outside the proposed slope limits along the Rt. side. The existing 2" plastic main crossings at Station 133+35 and 144+60 were replaced from the new main on the Rt. side to the Lt. side. The existing laterals at stations 135+95 and 143+50 are cutover from the old to the new main. The existing services are cutover from the existing to the relocated main.

- Station 151+50 – 158+00 - Enstar relocated the existing 6" plastic distribution main from Station 151+50, Rt., to Station 157+85, Rt. outside the proposed slope limits along the Rt. side. The existing 2" plastic main crossing at Station 160+85 has been replaced with a new 2" plastic crossing at station 158+00 connecting to the existing main on Rosewood Drive outside of the construction limits. The existing lateral at station 156+30 has been cutover from the old to the new main. The existing services are cutover from the existing to the relocated main.

- Station 162+00 – 200+00 – Enstar relocated the existing 6" plastic distribution main from Station 162+22, Rt., to 199+90, Rt. outside the proposed slope limits along the Rt. side. The existing 2" plastic main crossing at Stations 177+20 has been extended from the existing main to the new main. The existing 2" plastic main crossing at Station 174+90 has been replaced with a new 2" plastic crossing at approximately the same location. The existing lateral at station 163+10 has been cutover from the old to the new main. The existing 2" plastic main crossings at Station 190+80 and 197+00 were replaced with a new crossing at station 188+50 with new 2" pl. main installed along the Lt. side from the crossing to station 196+25 Lt. The existing services are cutover from the existing to the relocated main.

- Station 203+00 – 210+50 – Enstar relocated the existing 6" plastic distribution main from Station 203+08, Rt., to 210+30, Rt. outside the proposed slope limits along the Rt. side. The existing 2" plastic main crossing at Station 208+95 has been extended from the existing main to the new main. The existing lateral at station 203+90 is cutover from the old to the new main. The existing services are cutover from the existing to the relocated main.

- Station 226+60 – E.O.P. - Enstar relocated the existing 6" plastic distribution main from Station 226+60, Rt., to Station 243+90 Rt. outside the proposed slope limits along the Rt. side. The existing 1" plastic main crossing at Station 235+95 has been replaced with a new plastic crossing at approximately the same location. The existing 2" plastic main crossing at Station 231+65 has been extended from the existing main to the new main. The existing lateral at Seldon Road Station 25+15 Rt. has been cutover from

the old to the new main. The existing services are cutover from the existing to the relocated main.

- Station 240+40 to Seldon Road Station 13+85 - Enstar has installed a section of new 4" plastic main from the relocated 6" plastic main at Station 240+40, Rt, crossing Wasilla-Fishhook Road and extending to an existing 2" main on Parkwood Drive and then to an existing 4" plastic main at Seldon Road Station 13+85 Rt.

- **The remaining piece of relocation work to be completed by Enstar is replacement of the 2" plastic main crossing at station 227+65. The new crossing will be placed at approximately the same location. Enstar will require four (4) calendar days to complete this portion of work.**

When working near natural gas pipes, adhere to ENSTAR's "Safety Requirements for Excavation Adjacent to Natural Gas Pipelines." Attached as Appendix E.

Flexible carsonite markers for the Enstar facilities will be left in place and shall be protected during construction. Where markers are in direct conflict with highway construction, such as in cut or fill areas, markers shall be carefully removed and delivered to Enstar.

MATANUSKA ELECTRIC ASSOCIATION (MEA)

MEA will complete the permanent single phase and three phase power distribution facility relocations, and temporary single phase distribution construction and removal where required. MEA will complete the relocation of the primary relocation by April 30, 2006, with the temporary services which will be installed in corflo to be relocated in a permanent underground configuration by June 15, 2006. MEA relocation work is summarized as follows:

- Station 102+10-146+15 – MEA will relocate the entire existing overhead single phase distribution system generally paralleling Wasilla Fishhook Road from Station 102+10 to 146+15, including reuse of 4 existing power poles, installation of 24 new power and guy poles, and retirement of 22 existing power and guy poles.

  MEA will relocate 2 crossings of existing overhead three-phase distribution. The first three-phase crossing occurs at Station 117+70 and requires the relocation of a pole on each side to a location outside the slope limits. The second three-phase crossing occurs at Station 143+50 and requires the relocation of one pole on the Rt. side to a location outside the proposed slope limits. MEA will install 5 new short segments of underground power (150' or less per segment) and will retire 4 existing segments of underground power. MEA will install 2 new street light poles and will retire 3 existing street light poles.

  MEA will install and then remove temporary overhead power for an existing espresso stand at southwest quadrant of the intersection of Wasilla Fishhook Road and Danna Avenue. Temporary power will be extended from an

existing pole at Station 107+50, 280' Left, to an existing pole at Station 106+70, 145' Left, and then to the espresso stand. Temporary power will remain in service until a new power pole is installed at Station 107+90, 72' Left, and until new power lines are installed from an existing power pole at Station 102+10, 90' Left, to the new power pole at Station 107+90, 72' Left, and then to the espresso stand.

- Station 153+25-174+15 - MEA will relocate the entire existing overhead single phase distribution system generally paralleling Wasilla Fishhook Road from Station 153+25 to 174+15, including reuse of 3 existing power poles, installation of 9 new power and guy poles, and retirement of 11 existing power and guy poles.

  MEA will install 2 new short segments of underground power (200' or less per segment) and will retire 2 existing segments of underground power. MEA will install 2 new street light poles and will retire 2 existing street light poles. MEA will retire existing single phase power from Station 148+85 to 155+65, including 4 existing power poles.

  MEA will install temporary overhead power from Station 149+20 to 155+65. A temporary power pole will be installed at Station 149 +40, 20' Left. Temporary overhead power lines will be installed from an existing meter pole at Station 149+52, 81' Left, then to the temporary power pole at Station 149 +40, 20' Left, then to a new pole at Station 152+60, 45' Left, and an existing pole at Station 155+00, 60' Left, and ending at a new pole at Station 155+69, 70' Right. Temporary power will remain in service until Wasilla Fishhook Road is relocated from the existing alignment to the new alignment in the vicinity of Station 149+00, and until permanent power poles and power lines can subsequently be installed from Station 149+05, 70' Right, to Station 149+52, 81' Left.

- Station 174+15-209+20 - MEA will relocate intermittent sections of the existing overhead three phase distribution system and existing single phase taps and services generally paralleling Wasilla Fishhook Road from Station 174+15 to 209+20, including reuse of about 9 existing power poles, installation of about 16 new power and guy poles, and retirement of about 20 existing power and guy poles. MEA will install one new short segment of underground power (about 100').

- Station 213+60-224+15 Including Seldon Road Intersection - MEA will relocate intermittent sections of the existing overhead three phase distribution system and existing single phase taps and services generally paralleling Wasilla Fishhook Road from Station 209+20 to 213+60, and generally paralleling Seldon Road from Station 15+50 to 25+00, including reuse of 11 existing power poles, installation of about 11 new power and guy poles, and retirement of about 9 existing power and guy poles. MEA will install one new street light pole and will retire one existing street light pole.

- Station 146+15-155+65 -- Work described in this paragraph must be completed after Wasilla Fishhook Road is constructed to its new alignment. MEA will install new single phase distribution lines and services from Station 146+15 to 153+25, including reuse of 2 existing poles and installation of 5 new power poles. MEA will remove temporary overhead power from Station 149+20 to 155+65. MEA will require eight (8) calendar days to complete this work after the new roadway alignment is established.

MATANUSKA TELEPHONE ASSOCIATION (MTA)

As of November 1, 2005 MTA has completed installation of the new telecommunications facilities as described below. The splicing and cutover to the new facilities is scheduled for completion by April 1, 2006. There may be splice pits to be backfilled once the ground thaws.

- B.O.P. – Station 204+23 – MTA has relocated existing underground and overhead copper pair telephone cables paralleling Wasilla-Fishhook Road so that they are outside of the proposed slope limits. From the beginning of the project to Station 157+00, and from Station 186+75 to Station 204+23, relocated telephone cables continuously paralleling Wasilla-Fishhook Road are located primarily on the Left side. From Station 157+00 to Station 186+75, relocated telephone cables continuously paralleling Wasilla-Fishhook Road are located primarily on the Right side. In several areas, telephone cables are relocated on the opposite sides from the continuous cables described above, to maintain existing local service.

- Station 204+23 – E.O.P. – MTA has relocated existing underground and overhead copper pair telephone cables to outside of the proposed slope limits. From Station 204+23 to 225+00, relocated telephone cables paralleling Wasilla-Fishhook Road are primarily located on the right side. From Station 225+00 to 240+56, relocated telephone cables paralleling Wasilla-Fishhook Road are primarily located on the left side. From Station 240+56 to Seldon Road Station 26+30, the telephone cable is relocated on the Right side, to maintain existing local service. In addition, MTA has relocated the existing fiber optics cable, presently running east and west from Wasilla-Fishhook Road on the south side Seldon Road, to the south edge of the new ROW, including a crossing of Wasilla Fishhook Road at Station 240+56.

The road bore at station 203+50 will need to be lowered in place in conjunction with the excavation through this area. MTA will require three (3) calendar days to complete this work.

GENERAL COMMUNICATIONS INC. (GCI)

As of November 1, 2005 GCI has completed installation of the new cable television facilities as described below. The splicing and cutover to the new facilities is scheduled for completion by April 1, 2006. There may be splice pits to be backfilled once the ground thaws.

- B.O.P –Station 204+23 – GCI has relocated underground and overhead cable television facilities paralleling Wasilla-Fishhook Road so that they are outside the proposed slope limits. From the beginning of the project to Station 157+00, and from Station 186+75 to Station 204+23, continuous relocated cable television facilities paralleling Wasilla-Fishhook Road are located primarily on the Left side. From Station 157+00 to Station 186+75, continuous relocated cable television facilities paralleling Wasilla-Fishhook Road are located primarily on the Right side. In several areas, cable television facilities are relocated on the opposite sides from the continuous cable television facilities described above, to maintain existing local service. GCI underground cable television facilities were relocated with telephone cables in a joint MTA/GCI trench, except for a few relatively short relocations in GCI-only trench. GCI overhead cable television facilities will be relocated on new and existing MEA poles from Station 143+19 Left to Station 145+63 Right.

- Station 204+23 – E.O.P. – GCI has relocated underground and overhead cable television facilities paralleling Wasilla-Fishhook Road are relocated so that they are outside the proposed slope limits. From Station 204+23 to 225+00, relocated cable television facilities paralleling Wasilla-Fishhook Road are located primarily on the right side. From Station 225+00 to 240+56, relocated cable television facilities paralleling Wasilla-Fishhook Road are located primarily on the left side In several areas, additional cable television facilities will be relocated on the opposite side from the trunk cables to maintain existing local service. GCI underground cable television facilities will be relocated with telephone cables in a joint MTA/GCI trench, except for a few relatively short relocations in GCI-only trench. GCI overhead cable television facilities will be relocated onto a new MEA pole at Station 214+62 Right.

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

Dogwood, project #57851
Mat-Su Roads, project #57427
Palmer Urban, project #55430
Wasilla Crusey, project #55006
Palmer: Chugach Street #55002
Parks Hwy - Crusey St. to Lucas Rd, project # 53297
Palmer Fishhook #58121
Wasilla-Fishook Road, Sale and Removal (of Structures), project #54302.
Structures to be removed by April 15, 2006.

The following Mat-Su Borough projects may be under construction concurrently with this project.

Seldon Extension (beyond Lucille to Church)
Snowgoose Paving (Seldon to Schrock)

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

Standard Modification

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

Special Provision

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

SECTION 106

CONTROL OF MATERIAL

Special Provisions

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

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

Steel and iron products which are incorporated into the work, shall be manufactured in the United States except that minor amounts of steel and iron products of foreign manufacture may be used, provided the aggregate cost of such does not exceed one tenth of one percent (0.001) of the total contract amount, or $2500, whichever is greater. For the purposes of this paragraph, the cost is the value of the products as they are delivered to the project including freight.

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

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

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

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

Take whatever steps are necessary to ensure that manufacturing processes for each covered product comply with this provision. Non-conforming products shall be

replaced at no expense to the State. Failure to comply may also subject the Contractor to default and/or debarment. False statements may result in criminal penalties prescribed under Title 18 US Code Section 1001 and 1020. (02/07/05)S13

SECTION 107

LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Special Provisions

107-1.02 PERMITS, LICENSES, AND TAXES. Add the following after the first sentence: For the purposes of this subsection, the term "permits" will include but not be limited to Memorandum of Agreements (MOA's) and Temporary Construction Easements (TCE's).

Add the following: There is to be no vegetation clearing between May 1 and July 15 to avoid the taking of migratory birds, their eggs, feathers or nests.

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:

1. City of Wasilla Land Use Permit, Case # A05-72, dated December 22, 2004.
2. State of Alaska Dept. of Environmental Conservation Storm Water Non-Objection letter, Permit No. 05-WW-353-022, issued December 29, 2004.

Copies of the permits are contained in Appendix D.

Provide information to comply with the US Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) General Permit for Alaska to discharge storm water from the construction site. Refer to Section 641, Erosion, Sediment, and Pollution Control for requirements for this permit. (05/29/02)R7M98

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

107-1.11 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE. Add the following: If you require water for construction purpose from a non-municipal water source, obtain a Temporary Water Use Permit from the Water Resource Manager, and provide a copy to the Engineer. The Water Resource Manager is with the Department of Natural Resources in Anchorage and may be contacted at (907) 269-8624. (05/29/02)R7M98

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

107-1.14 OPENING SECTION OF THE PROJECT TO TRAFFIC. In the first sentence of the first paragraph, change the word "their" to "his or her." (ANH 11/15/04)

Add the following subsection:

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

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

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

SECTION 108

PROSECUTION AND PROGRESS

Special Provisions

108-1.03 PROSECUTION AND PROGRESS. Delete the last sentence of the first paragraph and substitute the following: Submit the following at the Preconstruction Conference:

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

1. A Critical Path Method (CPM) Schedule is required, in a format acceptable to the Engineer, showing the order the work will be carried out and the contemplated dates the Contractor and subcontractors will start and finish each of the salient features of the work, including scheduled periods of shutdown. Indicate anticipated periods of multiple-shift work in the CPM Schedule. Revise to the proposed CPM Schedule promptly. Promptly submit a revised CPM Schedule if there are substantial changes to the schedule, or upon request of the Engineer. See also Section 646. (12/13/02)R261M98

108-1.04 PROSECUTION AND PROGRESS. Add the following: Construction shall cease from 10PM to 6AM daily. (ANH, 10/24/05)

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

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

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

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

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

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

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

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

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

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

2) The scope of work will be distinct and identifiable with

specific contract items of work, bonding, or insurance requirements.

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

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

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

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

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

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

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

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

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

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

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

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

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

4. **DBE Rebuttal of a Finding of no CUF**. Consistent with the provisions of 49 CFR, Part 26.55(c)(4)&(5), before the Engineer makes a final finding that no CUF has been performed by a DBE firm the Engineer will coordinate notification of the presumptive finding through the Civil Rights Office to the Contractor, who will notify the DBE firm.

   The Engineer, in cooperation with the Civil Rights Office, may determine that the firm is performing a CUF if the rebuttal information convincingly demonstrates the type of work involved and normal industry practices establishes a CUF was performed by the DBE. Under no circumstances shall the Contractor take any action against the DBE firm until the Engineer has made a final determination. The Engineer's decisions on CUF matters are not administratively appealable to US DOT.

120-3.04 DEFAULT OF DBE. In the event that a DBE firm under contract or to whom a purchase order or similar agreement has been issued defaults on their work for whatever reason, the Contractor shall immediately notify the Engineer of the default and the circumstances surrounding the default.

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

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

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

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

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

120-4.01 METHOD OF MEASUREMENT. The Contractor will be entitled to count toward the DBE Utilization Goal those monies actually paid to certified DBEs for CUF work performed by the DBE as determined by the Engineer. The Contractor will receive credit for the utilization of the DBEs, as follows:

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

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

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

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

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

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

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

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

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

If the Contractor fails to utilize the DBEs listed on Form 25A325C as scheduled or fails to submit required documentation to verify proof of payment or documentation requested by the Department to help in the determination of CUF, the Department will consider this to be unsatisfactory work. If the Contractor fails to utilize Good Faith Efforts to replace a DBE, regardless of fault (except for Subsection 120-3.04 item 3), the Department will also consider this unsatisfactory work.

Unsatisfactory work may result in disqualification of the Contractor from future bidding under Subsection 102-1.13 and withholding of progress payments consistent with Subsection 109-1.06. (11/17/00)S 33

SECTION 201

CLEARING AND GRUBBING

Special Provisions

201-1.01 DESCRIPTION. Add the following: Remove and dispose of brush/debris piles from clearing **and grubbing produced by advanced** utility relocations.

201-3.03 GRUBBING. Delete the first sentence and replace with the following: Remove and dispose of all brush/debris piles, stumps, roots, moss, grass, turf, ***deleted*** debris or other objectionable material.

201-3.06 DISPOSAL. Delete the first paragraph and replace with the following: Dispose of cleared and grubbed material off the project at a location approved by the Engineer, including clearing and grubbing piles produced by advanced utility relocations. Cleared and grubbed material shall not be burned. (ANH, 12/05/05)

Delete the third, fourth, and fifth paragraphs in their entirety. (ANH, 12/05/05)

201-5.01 BASIS OF PAYMENT. Add the following: No separate payment will be made for removing and disposing brush/debris piles from the clearing **and grubbing produced by advanced** utility relocations, this work will be subsidiary to Item 201(3B), Clearing and Grubbing.

SECTION 202

REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Special Provisions

202-1.01 DESCRIPTION. Add the following: This work also includes the abandonment and/or disconnection of utilities and/or site cleanup where buildings have been removed by others; and coordination as necessary for the testing of soils necessary for the decommissioning of two drywells located on Carpenter Circle and Seldon Road. (ANH 10/24/05)

202-3.01 GENERAL. Add the following to the first paragraph: **Site cleanup includes removing and disposing of items leftover following removal of building superstructures by others, such as concrete pads, old pavement, and any portions of remaining foundations above the adjacent existing ground, as well as any appliances, storage tanks, tools, equipment, plastic safety fencing, and other junk items.** Remove any remaining building foundations or similar items that would protrude above the adjacent existing ground, then fill crawl space and/or basement voids to match the adjacent existing grade. (ANH 10/24/05)

Add the following: Carefully remove fences designated by the Engineer to the right-of-way limit, or to the end of the span beyond the right-of-way limit. These materials belong to the property owners, and shall be salvaged and stacked neatly in their yards. After the construction of fence is complete, use salvaged fencing to fill possible fencing gaps behind the property line. Use salvaged fencing according to Section 607, for reconstructed fences. (10/24/02)R17USC02

Remove or abandon wells according to DEC regulation 18AAC80.015. Remove or abandon septic tanks according to the DEC publication "Installers Manual for Conventional Onsite Domestic Wastewater Treatment and Disposal Systems". For more information on removal of wells and septic tanks contact the Wasilla DEC office at 376-5038. Service lines for both wells and septic tanks may be abandoned in place. Contact the Utilities listed in section 105 and confirm that the services have been disconnected at their source.

Two weeks prior to removing the drywell located at Carpenter Circle, notify the City of Wasilla so that they can arrange for the necessary environmental testing of soils within the drywells. Cooperate with the City of Wasilla by scheduling and adjusting the work to allow their testing. Similar notice, coordination, and cooperation shall be provided to the Matanuska-Susitna Borough, and to the Engineer for the testing and associated decommissioning of the drywell at Seldon Road. Provide written notice of intent to ADEC 30 days prior to commencing work on each well. (ANH 12/08/04)

202-3.02 MAIL BOXES. Add the following: The construction of mail box installations shall use new posts and mail boxes. Mail boxes shall be United States Postal Service approved, either traditional or contemporary design, having a minimum length of 21 inches, minimum width of 8 inches, and minimum height of

11 inches. Existing posts and foundations shall be removed with remaining holes backfilled to the level of surrounding ground. (04/18/05)R74USC04

For the cluster mail boxes to be relocated, the existing concrete pad shall be removed and relocated along with the mail boxes, and considered as one unit. The cluster mail box unit may be temporarily set at a Post Office approved location prior to final placement. Mail service is to remain uninterrupted. If any part of the mail box unit is broken or damaged, it shall be replaced or repaired by the Contractor at no additional cost to the Department. Coordinate with the Post Office at least one week prior to all mailbox relocations to assure that the Post Office knows when and where each mailbox will be located during each mail delivery.

202-3.03 REMOVAL OF BRIDGES, CULVERTS, AND OTHER DRAINAGE STRUCTURES. Add the following to the third paragraph: For pipes located under the roadway, fill the pipe with a concrete slurry **containing 4-7% cement by weight** prior to abandoning in place.

202-3.05 REMOVAL OF PAVEMENT, SIDEWALKS, AND CURBS. Add the following: Remove and **reuse** all existing and temporary asphalt pavement ***delete*** as recycled asphalt material (RAM) in accordance with subsection 301-2.01, Materials, **or as Processed Asphalt Pavement (PAP) in accordance with subsection 306-2.01, Materials**.

delete

(02/15/05)R84A

Add the following Subsection:

202-3.06 SALVAGING. Notify the Engineer a minimum of five (5) days before removing the light pole to be abandoned. Deliver the light pole salvaged on Kalli Circle to the City of Wasilla M&O yard. Deliver all other salvaged light poles to DOT M&O, Palmer. Deliver all signs salvaged on Borough side roads to Mat-Su Borough Maintenance, 1420 Industrial Way (Vroman Building), Palmer. Items not designated for salvage shall become the Contractor's property.

202-5.01 BASIS OF PAYMENT. Add the following to the first paragraph: **Payment for Item 202(1) also includes site cleanup as described in subsection 202-3.01. Borrow required for filling crawl space and/or basement voids, and removing and disposing of plastic safety fencing will be subsidiary to item 202(1).**

Add the following: Activities associated with pipes to be abandoned in place are subsidiary to Removal of Culvert Pipe and will not be measured for payment.

Item 202(12A). Relocate Cluster Mail Boxes will be paid one time for each unit relocated to its final position. Any temporary relocation of the mail box units will not be paid for separately.

Item 202(13). Removal of Fence will be paid per linear foot of fence taken down and disposed. Gates removed will also be paid per linear foot under this item.

Item 202(22). At the contract unit price for each well capped according to DEC regulations. Contacting the Utilities listed in section 105 and confirming that the services have been disconnected at their source and arranging for disconnection and any necessary support for disconnection is subsidiary to this item.

Item 202(27). At the contract unit price for each tank abandoned according to DEC regulations.

Add the following pay items:

Pay Item	Pay Unit
202(12A) Relocate Cluster Mail Boxes	Each
202(13) Removal of Fence	Linear Foot
202(22) Ground Water Well Abandonment	Each
202(27) Septic Tank Abandonment	Each

SECTION 203

EXCAVATION AND EMBANKMENT

Special Provision

203-1.01 DESCRIPTION. Add the following: Special ditch shall consist of the final shaping of designated ditches and slopes for drainage by grading with a small dozer, motor grader, or other suitable means approved by the Engineer. (02/26/03)R20USC02

203-3.01 GENERAL. Delete the third paragraph and replace with the following: Excavate and embank material only within the limits shown on the Plans or as directed by the Engineer. Prevent disturbing material and vegetation outside of the clearing and grubbing limits shown on the Plans. (ANH, 12/05/05)

Delete the sixth paragraph and add the following: Unless directed otherwise by the Engineer, dispose of unsuitable material or excess usable material at approved locations off the project.

Add the following to the last paragraph: Before obliterating the existing roadway, remove the existing pavement and dispose according to Subsection 202-3.05, Removal of Pavement, Sidewalks, and Curbs. (11/05/02)R177USC02

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

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. Any reduction in excavation or Borrow quantities as a result because of this condition shall not constitute a basis for adjustment in contract unit prices except as provided for in Section 104, Scope of Work.

(11/18/04)R23USC02

203-3.04 COMPACTION WITH MOISTURE AND DENSITY CONTROL. Delete this section in it's entirety and substitute the following: Construct embankments with moisture and density control from specified materials placed and compacted at approximately optimum moisture content. Dry or moisten material as required.

Compact embankment material to not less than 95 percent of the maximum dry density as determined by WAQTC FOP for AASHTO T 99 / T 180 or ATM 212.

The Engineer will determine in-place field densities using WAQTC FOP for AASHTO T
310 and WAQTC FOP for AASHTO T 224. (matls 2/05)

Add the following Subsections:

203-3.06 CONTAMINATED MATERIAL TESTING. This work shall consist of testing potentially contaminated soils excavated between Station 244+50 and Station 248+10 and from Station 23+00 to Station 28+00 for contaminants. Each truckload of soil transported from this location or other locations at the direction of the Engineer shall be examined for contamination.

In accordance with Subsection 203-3.07, Excavation of Contaminated Material, the Contractor shall retain an independent test laboratory to conduct the following tests:

1. **Field Tests**

    a. **Organic Vapor Analyzer (OVA) Analysis**
    b. **Visual Analysis (Petroleum Odor)**

2. **Laboratory Tests**

    a. **Volatile Aromatic Hydrocarbons**
    b. **Total Petroleum Hydrocarbons**

The Contractor shall verbal give the test results to the Engineer immediately. The Contractor shall transmit the test results in writing directly to the Engineer.

The Contractor shall obtain the services of a hazardous waste professional to conduct field testing using an organic vapor analyzer (OVA) or equivalent equipped with a photoionizing detector (PID), or other approved DEC instrument. The Contractor shall submit the name of the hazardous waste professional to the Engineer at the preconstruction conference. The hazardous waste professional shall be available at all times hauling is in progress to conduct the required field tests.

The hazardous waste professional shall sample and test in accordance with standard DEC approved testing procedures. If an OVA response indicates the presence of any contamination, the soils will have failed the test and will be designated as contaminated. If no response is observed, the soil will be examined for odor. If a petroleum odor is detected, the soils will fail the test and will be designated as contaminated. If no petroleum odor is detected, the soil will be considered to have passed field criteria.

The hazardous waste professional shall be responsible for ensuring soils exhibiting an OVA response that indicate the presence of any contamination, or soils exhibiting characteristics of fuel contamination (i.e. odor, sheen, or stain),

are identified to the Engineer.

Contaminated material will not be incorporated into the project and shall be handled in accordance with 203-3.07, Excavation of Contaminated Material.

The OVA will be calibrated at the beginning and end of each day and after every four (4) hours of use. (06/21/04)R149USC04

203-3.07 EXCAVATION OF CONTAMINATED MATERIAL. This work shall consist of removing and disposing of fuel contaminated soils encountered during the excavation. Disposal of fuel contaminated soils shall be at a location approved by the Engineer.

1. **Determining Limits of Contaminated Soil. The exact limits of potential contaminated soil within the excavation can not be determined until the material is exposed. Once exposed, the soil shall be tested in accordance with Subsection 203-3.06, Contaminated Material Testing. Testing will verify the contamination levels in the soils and determine if the soils can be disposed of as unclassified excavation or if they will require special handling. Soils that have a response from photoionizing detector or equivalent instrument of 1 part per million or more above background are considered to be "contaminated" and will require special handling and shall be disposed of in accordance with this Subsection.**

2. **Worker Health and Safety. Prior to the excavation of any soils identified as contaminated, the Contractor shall assure the personnel working in the area of potential contamination have received the State of Alaska, Department of Labor, Health and Safety Training. The Contractor shall provide the Engineer a list of the personnel and subcontractors that will be working within the area identified as being potentially contaminated.**

   The Contractor shall notify personnel and subcontractors, prior to their beginning work at the site, they will be working in an area identified as being potentially contaminated with petroleum fuel.

3. **Contaminated Soil Removal and Segregation. In the event the Contractor must stockpile contaminated soil, a liner, cover and temporary fencing will be required. The size and location of the liner shall be as approved by the Engineer. The Contractor shall cover and secure the stockpile at the end of each work day. The Contractor shall be responsible for removal of the stockpile liner, safety fence, and cover once the fuel contaminated soil is removed.**

   The method of disposal shall be in accordance with Department of Environmental Conservation guidelines for reducing BTEX or TPH in soils. Additional testing required at the disposal site shall be done in accordance with Subsection 203-3.06, Contaminated Material Testing, unless otherwise directed by the Engineer.

Prior to the Contractor backfilling the excavation, random samples from the excavation (bottom and sides) shall be taken for confirmation testing. Backfill within the limits of planned excavation shall meet the requirements for the item of work involved. Backfill outside of the planned excavation limits shall meet the requirements of Selected Material, Type C or better as directed by the Engineer.

4. **Responsibility. With respect to preexisting hazardous substances or contaminated materials in the project area, nothing in this contract is intended to impose upon the Contractor, or to require the Contractor to assume, the status under state or federal environmental law of a facility owner or operator, or an owner or generator of those preexisting hazardous substances or contaminated materials. The Contractor is advised, however, the Contractor shall assume the responsibility to obtain administrative approvals and to coordinate the activities with the Alaska Department of Environmental Conservation and/or any federal agency having jurisdiction, to carefully abide by the applicable laws, regulations, and the terms of any administrative approvals, and to otherwise use environmentally sound management practices such that the Contractor does not, as a result of its own actions, become a facility owner or operator, or an owner or generator of hazardous substances by reason of an unpermitted release of hazardous substances. (06/21/04)**R149USC04

203-4.01 METHOD OF MEASUREMENT.

Add the following to item #1: No reduction in volume will be made for material removed under Section 201 and under Section 202.

Add the following:

9. Item 203(36). Measurement of special ditch, whether flat bottom or "V" ditch, will be measured for payment by the station along the center of the ditch for each ditch so designated, constructed and accepted by the Engineer.

Add the following:

Providing a hazardous waste professional to test for contaminated soils will not be measured for payment. Testing soils to determine contamination will be measured for payment under Item 203(29), Contaminated Material Testing.

Item 203(28), Fuel Contaminated Soil Special Handling, will be measured for payment on a time and materials basis in accordance with Subsection 109-1.05, Compensation for Extra Work on Time and Materials Basis. Backfilling within the excavation limits will be measured for payment as Borrow.

No separate payment will be made for providing the hazardous waste professional, this will be subsidiary to Item 203(29), Contaminated Material Testing. (06/21/04)R149USC04

203-5.01 BASIS OF PAYMENT. Add the following: Payment for special ditch will be full compensation for furnishing equipment, labor, tools and incidentals to provide the preparation, excavation and shaping necessary to complete the work. (02/26/03)R20USC02

Payment will be made under:

Pay Item	Pay Unit
203(36) Special Ditch	Station
203(28) Fuel Contaminated Soil Special Handling	**Contingent Sum**
203(29) Contaminated Material Testing	**Contingent Sum**

ADDENDUM NO. 2
ATTACHMENT NO. 4

SECTION 301

AGGREGATE BASE AND SURFACE COURSE

Special Provisions

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

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

301-3.01 PLACING. Add the following: Base course material used for a separated sidewalk and pathway foundation shall be placed with a "Layton box" or similar equipment capable of providing a specified depth with a uniform surface. (09/01/89)R26modified

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

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

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

301-5.01 BASIS OF PAYMENT. Add the following: If recycled asphalt material is substituted for aggregate base course ***delete*** it will be paid for as Item 301(1), Aggregate Base Course ***delete***at the unit price shown on the bid schedule ***delete***. (11/05/02)R176USC02

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Addendum No.1
Attachment No. 8

SECTION 306

ASPHALT TREATED BASE COURSE

Special Provisions

306-2.01 MATERIALS. Delete Aggregate and Asphalt and replace with the following.

Aggregate. Conform to subsection 703-2.04. Combine aggregate from processed pavement and crushed aggregate for asphalt concrete mix before testing.

Asphalt. The total residual asphalt cement may be a combination of PG 52-28 and the asphalt binder in the existing asphalt or only PG 52-28. Documentation and conformance is only required for PG 52-28. The Engineer may conditionally accept asphalt cement at the source. Provide a manufacture's certificate of compliance, according to subsection 106-1.05, and test results of applicable quality requirements of Section 702 before shipping the material.

Add the following:

Processed Asphalt Pavement (PAP).

Process existing pavement removed under subsection 202-3.05 so material passes the 1.5 inch sieve. Stockpile the material separately from the Asphalt Concrete **aggregate.**

Pavement aggregates. Perform one gradation and one asphalt content test for every 1000 tons of PAP or a minimum of 10 sets of tests which ever is greater. From these samples, 10 samples shall be split and submitted to the State Materials lab.

CONSTRUCTION REQUIREMENTS

306-3.01 COMPOSITION OF MIXES. Replace this subsection with the following: If recycled materials are used, submit process control data of the PAP and of the asphalt concrete aggregates supporting proposed job mix design gradations. The residual asphalt cement of the mix shall target 5 percent of total mix weight.

At least 15 calendar days before the production, submit the following to the Engineer:

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 control information, and the blend ratio of each aggregate stockpile and PAP. The proposed mix gradation must meet the requirements of Table 703-3, Type II. Submit

gradation and asphalt content process control data of PAP for the Job Mix Design.

Provide representative samples of each of the aggregates in the blend. Sample sizes: 100 pounds of each intermediate and/or coarse aggregate, 200 pounds of fine aggregate, 25 pounds of blend sand, and 200 pounds of PAP.

A minimum of five separate 1-gallon samples of asphalt cement proposed for use in the mixture, including the name of the product, the manufacturer, test results as required in Section 702, manufacturer's certificate of compliance according to Section 106, and a temperature viscosity curve for the asphalt cement.

A 1/2 pint sample of the anti-strip additive proposed, including the name of product, manufacturer, and manufacturer's data sheet, and current Materials Safety Data Sheet (MSDS).

From this information, the Engineer will establish the Job Mix Design using ATM 417, which will become a part of the Contract. The Job Mix Design shall meet the requirements of Type II, Class B in Table 401-1, Asphalt Concrete Mix Design Requirements. PAP may be used in the mixture. The design minimum residual asphalt content (PAP residual plus PG 52-28) is 5 percent by weight of total mix and with 1/4 percent anti-strip by weight of PG 52-28. The Job Mix Design will specify the design aggregate gradation, gradation of virgin aggregate blend, percent of residual asphalt cement, percentage of PAP, and mixing and compaction temperature ranges.

Submit changes in the Job Mix design warranted by changes in the source of asphalt cement, the source of aggregates, aggregate quality, aggregate gradations, or blend ratios, in the same manner as the original submittal. A new Job Mix Design will only apply to asphalt concrete mixture produced after submitting the new aggregate gradation.

Approved Job Mix Designs will have the full tolerances shown in Table 401-2 applied and will not be limited to the broad band listed in Table 703-3. Tolerances for the largest sieve specified will be plus 0 percent and minus 1 percent.

306-3.02 WEATHER LIMITATIONS. Delete the requirements of this subsection and substitute the following: Apply the requirements of subsection 401-3.01.

306-3.03 STOCKPILING. Delete this subsection in its entirety.

306-3.04 EQUIPMENT. Add the following: Apply the requirements of subsection 401-3.02 to equipment.

Add the following to item 1.:

If recycled materials are used, the asphalt plant shall combine PAP with asphalt concrete aggregates to produce a hot recycled asphalt treated base mixture.

Delete subsections 306-3.05 and 306-3.06 and substitute the requirements of subsections 401-3.08 and 401-3.09.

Delete subsections 306-3.08 and 306-3.09 and substitute the requirements of subsections 401-3.12 and 401-3.13.

Apply the requirements of subsections 401-3.07, 401-3.10, 401-3.11, and 401-3.16.

Add the following subsection:

306-3.12 PATCHING DEFECTIVE AREAS. Remove ATB that becomes contaminated with foreign material, is segregated, or is 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 conforming to Section 402 and allow to cure. Place and compact fresh ATB to grade and smoothness requirements.

306-4.01 METHOD OF MEASUREMENT. Add the following:

Asphalt Cement. Will not be measured for payment, the cost of the asphalt cement will be subsidiary to Item 306(1).

Change the third paragraph to read:

Anti-strip additive. Will not be measured for payment, the cost of the anti-strip additive will be subsidiary to Item 306(1).

Add the following subsection:

306-4.02 ACCEPTANCE SAMPLING AND TESTING. Sample and test Asphalt Treated Base at 1000 ton intervals for acceptance. The Department has the exclusive right and responsibility for determining the acceptability of materials incorporated into the project. The Engineer will perform acceptance sampling and testing. The Engineer will make the results of the acceptance testing available to the Contractor within seven working days from the date of sampling. Sample the blended virgin aggregate at the cold feed. The Contractor may select the sample location of mix to determine the asphalt content.

Within 24 hours of final rolling, cut one 6 inch diameter core, full depth, from the finished mat to determine density. Neatly cut the sample using a core drill at the randomly selected location marked by the Engineer. Use a core extractor to prevent damage to the core. Do not cut a sample over a bridge deck.

Apply Tolerances shown in Table 401-2 to test results to determine compliance with mix design.

The Engineer will test for density, gradation, and asphalt content as specified in subsection 401-4.02.

306-5.01 BASIS OF PAYMENT. Add the following: Asphalt cement and anti-strip shall not be paid separately but shall be subsidiary to and included in the Asphalt Treated Base contract price. If the Mix Design requires more than 5% asphalt cement, the quantity in excess of 5% shall be paid for at the Contract unit price for Item 401(2) Asphalt Cement, PG 52-28.

Patching defective areas shall be subsidiary to Item 306(1). (02/05/03)R226M98

Delete Section 401 in its entirety and substitute the following:

SECTION 401

ASPHALT CONCRETE PAVEMENT

Special Provisions

401-1.01 DESCRIPTION. Construct one or more layers of plant-mixed hot asphalt concrete pavement on an approved surface, to the lines, grades, and depths shown on the Plans.

MATERIALS

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

TABLE 401-1
ASPHALT CONCRETE MIX DESIGN REQUIREMENTS

DESIGN PARAMETERS	CLASS "A"	CLASS "B"
Stability, pounds	1800 min.	1200 min.
Flow, 0.01 inch	8-14	8-16
Voids in Total Mix, %	3-5	3-5
Compaction, number of blows each side of test specimen	75	50
Percent Voids Filled with Asphalt (VFA)	65-75	65-78
Asphalt Content, min. %	5.0	5.0
Dust-asphalt ratio*	0.6-1.4	0.6-1.4
Voids in the Mineral Aggregate (VMA), %, min.		
Type I	12.0	11.0
Type II	13.0	12.0
Type III, IV	14.0	13.0

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

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

Target values for gradation in the Job Mix Design must be within the broad band limits shown in Table 703-3, for the type of asphalt concrete pavement specified but asphalt concrete mixture will have the full tolerances in Table 401-2 applied for evaluation according to 401-4.03 except the tolerances for the largest sieve specified

will be plus 0% and minus 1%, and the #200 sieve is limited by the broad band limits.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Furnish the following documents at delivery:

1. Manufacturer's certificate of compliance (106-1.05).
2. Conformance test reports for the batch (Section 702).
3. Batch number and storage tanks used.
4. Date and time of load out for delivery.
5. Type, grade, temperature, and quantity of asphalt cement loaded.
6. Type and percent of anti-strip added.

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

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

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

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

CONSTRUCTION REQUIREMENTS

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

Place the top layer of paving or surface course between May 1 and August 11. Place bottom and middle layers of asphalt, leveling courses, and treated bases according to the limitations of this Subsection. (07/03/03)S90

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

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

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

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

401-3.04 HAULING EQUIPMENT. Haul asphalt mixtures in trucks with tight, clean, smooth metal beds, thinly coated with a minimum amount of paraffin oil, lime water solution, or an approved manufactured asphalt release agent. Do not use petroleum fuel as an asphalt release agent.

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

401-3.05 ASPHALT PAVERS. Use self-propelled pavers equipped with a heated vibratory screed. Control grade and cross slope with automatic grade and slope control devices. Use a 30-foot minimum ski, or other approved grade follower, to automatically actuate the paver screed control system. Use grade control on either (a) both the high and low sides or (b) grade control on the high side and slope control on the low side.

Use a screed assembly that produces a finished surface of the required smoothness, thickness and texture without tearing, shoving or displacing the asphalt concrete mixture. Heat and vibrate screed extensions. Place auger extensions within 20 inches of the screed extensions or according to written manufacturer's recommendations.

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

The following specific requirements apply to the identified bituminous pavers:

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

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

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

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

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

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

401-3.07 PREPARATION OF EXISTING SURFACE. Prepare existing surfaces in conformance with the Plans and Specifications. Clean out loose material from cracks in existing pavement wider than 1 inch (+1 inch) in width full depth, then fill using asphalt concrete, and tamp in place. Clean, wash, and sweep existing paved surfaces of loose material. The Engineer must approve existing surface before applying tack coat.

Preparation of a milled surface,

- Prelevel remaining ruts, pavement delaminations, or depressions having a depth greater than ½-inch with Asphalt Concrete, Type IV. No density testing

is required for the leveling course material. The Engineer will inspect and accept this material.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

401-3.13 COMPACTION. Thoroughly and uniformly compact the asphalt concrete mixture by rolling. In areas not accessible to large rollers, compact with mechanical tampers or trench rollers. Compact asphalt concrete mixture immediately after it is placed and spread, and as soon as it can be compacted without undue displacement, cracking or shoving. Perform initial breakdown compaction while the asphalt concrete surface mixture temperature is greater than 235°F and finish compaction before the surface temperature reaches 150°F. (07/03/03)E02

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

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

The target value for density is 94 percent of the maximum specific gravity (MSG), as determined by WAQTC FOP for AASHTO T 209. For the first lot of each type of

asphalt concrete pavement, the Job Mix Design will determine the MSG. For additional lots, the MSG will be determined by the sample from the first sublot of each lot.

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

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

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

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

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

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

Offset the longitudinal joints in one layer from the joint in the layer immediately below by at least 6 inches. Align the joints of the top layer at the centerline or lane lines. Where preformed marking tape striping is required, offset the longitudinal joint in the top layer not more than 6 inches from the edge of the stripe.

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

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

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

401-3.15 SURFACE REQUIREMENTS AND TOLERANCE. The Engineer will test the finished surface after final rolling at selected locations using a 10-foot straightedge. Correct at your own expense any variations from the testing edge, between any two contacts of more than 1/4 inch.

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

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

401-3.16 PATCHING DEFECTIVE AREAS. Remove any asphalt concrete mixture that becomes contaminated with foreign material, is segregated, or is in any way determined to be defective. Do not skin patch. Remove defective materials for the full thickness of the course. Cut the pavement so that all edges are vertical, the sides are parallel to the direction of traffic and the ends are skewed between 15-25 degrees. Coat edges with a tack coat meeting Section 402 and allow to cure. Place and compact fresh asphalt concrete mixture according to subsection 401-3.15 to grade and smoothness requirements.

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

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

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

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

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

By the area of final pavement surface.

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

Asphalt Cement. By the ton, as follows. Method 1 will be used for determining asphalt quantity unless otherwise directed in writing. The procedure initially used will be the one used for the duration of the project. No payment will be made for any asphalt cement more than 0.4 percent above the optimum asphalt content specified in the Job Mix Design.

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

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

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

   Remnant or diversion will be calculated based on tank stickings or weighing the remaining asphalt cement. The Engineer will determine the method. The weight of asphalt cement in waste asphalt concrete mixture will be calculated using the target value for asphalt cement as specified in the Job Mix Design.

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

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

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

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

A lot will normally be 5,000 tons. The lot will be divided into sublots of 500 tons, each randomly sampled and tested for asphalt cement content, density, and gradation according to this subsection. If the project has more than 1 lot, and less than 8 additional sublots have been sampled at the time a lot is terminated, either due to

completion of paving operations or the end of the construction season (winter shutdown), the material in the shortened lot will be included as part of the prior lot. The price adjustment computed, according to subsection 401-4.03, for the prior lot will include the samples from the shortened lot.

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

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

For contract quantity of less than 1,500 tons (and for temporary pavement), hot mix asphalt will be accepted for payment based on the Engineer's approval of a Job Mix Design (JMD) and the placement and compaction of the hot mix asphalt to the specified depth and finished surface requirements and tolerances. Remove and replace any hot mix asphalt that does not conform to the approved JMD.

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

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

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

3. Aggregate Gradation.

    a. Drum Mix Plants. Samples taken for the determination of aggregate gradation from drum mix plants will be from either the combined

aggregate cold feed conveyor via a diverter device, or from the stopped conveyor belt or from the same location as samples for the determination of asphalt cement content. Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if applicable. The aggregate gradation for samples from the conveyor system will be determined according to WAQTC FOP for AASHTO T 27/T 11. For asphalt concrete mixture samples, the gradation will be determined according to WAQTC FOP for AASHTO T 30 from the aggregate remaining after the ignition oven (WAQTC FOP for AASHTO T 308) has burned off the asphalt cement. Locate diverter devices for obtaining aggregate samples from drum mix plants on the conveyor system delivering combined aggregates into the drum. Divert aggregate from the full width of the conveyor system and maintain the diverter device to provide a representative sample of aggregate incorporated into the asphalt concrete mixture.

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

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

5. Retesting. A retest of any sample outside the limits specified in Table 401-2 may be requested provided the quality control requirements of 401-2.05 are met. Deliver this request in writing to the Engineer within 7 days of receipt of the initial test result. The Engineer will mark the sample location for the density retest. The original test results for gradation and asphalt cement content, or density will be discarded and the retest result will be used in the price adjustment calculation regardless of whether the retest result gives a

higher or lower pay factor. Only one retest per sample is allowed. Except for the first lot, gradation or asphalt cement content retesting of the sample from the first sublot of a lot will include retesting for the MSG.

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

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

The price adjustment is based on the lower of two pay factors. The first factor is a composite pay factor for asphalt concrete mixture, which includes gradation and asphalt cement content. The second factor is for density. Sublot density values used will be lesser of either the random mat density or an average of cyclic low densities taken within the limits of the sublot.

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

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

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

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

If the density test result is an outlier, the density test result will not be included in the price adjustment, however, the gradation and asphalt cement content results for that

sublot will be included provided neither is an outlier.

Quality Level Analysis. Pay factors are computed as follows:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

   Quality Level = $(P_L + P_U) - 100$

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

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

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

The CPF is rounded to the nearest hundredth.

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

TABLE 401-3
WEIGHT FACTORS

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

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

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

* CPF or DPF, whichever is lower.

Base = $57 per ton

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

EVALUATION OF ASPHALT CEMENT

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

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

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

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

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

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

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.

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

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

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

2. If project average joint density is greater than 91% MSG apply the following incentive:

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

The longitudinal joint price adjustment will be included in Item 401(6), Asphalt Price Adjustment.

401-5.01 BASIS OF PAYMENT.

The anti-strip additive and asphalt cement required for preleveling the highway and temporary pavement shall be subsidiary to Items 401(13) Preleveling, Asphalt Concrete, Type IV, Class B, and 401(3), Temporary Pavement.

Anti-stripping additives and crack sealing (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:

Pay Item	**Pay Unit**
401(1) Asphalt Concrete, Type __; Class __	Ton
401(2) Asphalt Cement, __	Ton
401(3) Temporary Pavement	Ton
401(4) Asphalt Concrete, Type __; Class __	Square Yard
401(6) Asphalt Price Adjustment	Contingent Sum
401(9) Longitudinal Joint Adhesive and Sealing	Lineal Foot
401(13) Preleveling Asphalt Concrete, Type IV, Class B	Ton

(10/26/05)R199USC04

SECTION 504

STEEL STRUCTURES

Special Provisions

CONSTRUCTION REQUIREMENTS

504-3.01 FABRICATION.

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

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

SECTION 505

PILING

Special Provisions

505-3.03 PILE BEARING VALUES. Delete the first paragraph of this subection and substitute the following: Drive piles, except piles for lighting standards, to the required ultimate bearing capacity. For lighting standards, install piles of sufficient length to cut the pile at the required cut-off elevation and to provide the minimum installed length shown on the Plans.

505-3.09 DRIVING PILES. Add the following: Sites for the lighting standard foundations can contain subsurface soils that consist of very dense sandy gravel with cobbles and boulders.

When the minimum pile length shown on the Plans can not be installed for a lighting standard foundation, install the pile tip to an elevation established by the Engineer.

505-4.01 METHOD OF MEASUREMENT. Add the following to the second paragraph:

Do not measure piles for lighting standards for payment.

505-5.01 BASIS OF PAYMENT. Add the following to the second paragraph: Include costs of furnishing and installing piles for lighting standards in Item 660(3), Highway Lighting System Complete.

(04/15/05)R65USC04

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-xx), Pipe, is listed in the bid schedule, furnish either Corrugated Steel Pipe (CSP) or Reinforced Concrete Pipe. Corrugated Polyethylene Pipe is not allowed. End Sections for Metal Pipe must be of the same material as the pipe.

Add the following: Culvert marker posts shall meet the requirements of Subsection 730-2.05, Flexible Delineator Posts. The color shall be blue with no other markings. The 2.5-inch by 6-foot post shall be rectangular in cross-section with reinforcing ribs capable of a minimum bending radius of 9 inches. It shall have a 2.25 inch by 6 inch panel of reflective sheeting Hi Silver (white) 3M intensity grade located at the top of the marker post on both sides.

603-3.02 LAYING PIPE. Add the following:

Storm Drain/Water Line Crossing Requirements - The proposed storm drain crosses existing water mains at Sta 108+20, 20' Left, at Sta 108+70, 15' Left, and at Sta 110+15, 15' Right. At all of these crossings, the ADEC requirements should be adhered to. These requirements are summarized as follows:

- 18 inches minimum out-to-out vertical separation.
- 9 feet minimum horizontal separation of storm drain pipe joints from the water main.
- storm drain must be bedded in Selected Material, Type A classified bedding (passing 3" sieve).

If these or other ADEC requirements can't be met, then a waiver must be obtained from ADEC.

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, ends of approach 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. (08/27/03)R42USC

Add the following pay item:

Pay Item	Pay Unit
603(26) End Section for _Inch Pipe Arch	Each

SECTION 604

MANHOLES AND INLETS

Special Provisions

604-3.01 CONSTRUCTION REQUIREMENTS. Add the following after the first paragraph: Any proposed access manhole that falls within a concrete sidewalk or asphalt pathway must have a lid with a rough cobbled grit surface, or be specifically designed to hold a minimum of 1-inch of concrete or asphalt, as applicable.

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

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

Add the following: Notify the Engineer a minimum of five (5) days prior to removing the frame and grate. The Engineer will notify DOT&PF M&O and have an M&O representative physically identify frames and grates to be salvaged. Deliver frames and grates designated to be salvaged to the Palmer DOT&PF M&O yard. Frames and grates not designated for salvage by DOT&PF M&O shall become the Contractor's property.

The finished thickness of grade rings used between the top barrel section of the manhole and the bottom of the metal frame shall not exceed 12". (PC 2-23-05)

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

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. (02/23/05)R43USC04

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

Pay Item	Pay Unit
604(1) Storm Drain Manhole, Type __	Each

SECTION 606

GUARDRAIL

Special Provisions

606-3.07 REMOVAL AND DISPOSAL OF EXISTING GUARDRAIL. Delete the last sentence and substitute the following: Notify the Engineer a minimum of five (5) days prior to removing guardrail for disposal. The Engineer will notify ADOT&PF M&O and have an M&O representative physically identify portions of guardrail to be salvaged. Deliver guardrail and associated hardware designated to be salvaged to the Palmer ADOT&PF M&O yard. Remaining items removed become your property. (06/12/03)R259M98

SECTION 607

FENCES

Special Provisions

607-3.01 CONSTRUCTION REQUIREMENTS. Add the following to the last paragraph: Install new posts and foundations for reconstructed fences.

SECTION 608

SIDEWALKS

Special Provisions

608-1.01 DESCRIPTION. Add the following: This work also consists of constructing asphalt pathway(s) and pavement inside raised medians, in conformance with the Plans.

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

2. Asphalt Sidewalk , Asphalt Pathway, and Raised Median Paving

Asphalt Cement, PG 52-28	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

(02/01/00)R47USC

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 with new concrete and integrally attached tactile tile, when retrofitting existing cured concrete ramps. Install tile so there are no vertical changes in grade exceeding 0.25 inch or horizontal gaps exceeding 0.5 inch. Align pattern on a square grid in the predominant direction of travel. Detectable warnings are made of composite materials, safety yellow color, slip resistant, with truncated dome pattern.

When detectable warnings are required for uncurbed asphalt path to roadway intersections, install Top Mark or approved equal heat activated glue down 12" x 24" panels according to the manufactures instructions full width of the path.

Detectable warnings shall be manufactured and installed in accordance with Americans with Disabilities Act Accessible Guideline.

Add the following subsection:

608-3.06 ASPHALT PATHWAY. Construct asphalt pathway according to Subsection 608-3.02, Asphalt Sidewalks.

Standard Modification

608-4.01 METHOD OF MEASUREMENT. Replace Curb Ramp with the following:

Curb Ramp. By each installation, complete in place and accepted by the Engineer, including removal of the existing curb ramp, construction of the detectable warnings, ramp runs, flares, and landings necessary to provide a single street-level access. (06/30/04)E20

Special Provisions

608-4.01 METHOD OF MEASUREMENT. Add the following: Asphalt pathway and raised median paving will be measured and paid under asphalt sidewalk. Asphalt cement will not be measured for payment. (02/01/00)R47USC

608-5.01 BASIS OF PAYMENT. Add the following: Concrete and tactile warning bumps will be paid for by each installation under Item 608(10) Detectable Warning Tiles.

Payment will be made under:

Pay Item	**Pay Unit**
608(10) Detectable Warning Tiles	Each

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 610

DITCH LINING

Special Provisions

610-5.01 BASIS OF PAYMENT. Add the following: Ditch Checks will be paid for as Ditch Lining. (ANH 12/12/04)

SECTION 615

STANDARD SIGNS

Special Provisions

615-2.01 MATERIALS. Under item 1. delete the first sentence and substitute the following: Unless Shop Drawings have been provided in the Contract, submit shop drawings for signs that require the use of the Alaska Sign Design Specifications (ASDS), the Department of Transportation and Public Facilities - Sign Face Fabrication Requirements, and the Alaska Traffic Manual, letter width and spacing charts for approval before fabrication. . (11/06/02)R50USC02

Under item 2. Delete the last paragraph.

Standard Modifications

615-2.01 MATERIALS. Under Item 2. Sign Fabrication, delete Items b. and c. and replace with the following:

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

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

(6/30/04)E13

Special Provisions

615-3.01 CONSTRUCTION REQUIREMENTS. Delete item 1 and substitute the following:

1. Install sign post foundations in accordance with Section 660-3.02

Delete item 7 and substitute the following: Deliver sign panels, posts and hardware to the State Maintenance Yard located at 289 Inner Springer Loop Road in Palmer.

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.

(11/06/02)R50USC02

Addendum No.1
Attachment No. 9

SECTION 618

SEEDING

Special Provisions

618-1.01 DESCRIPTION. Add the following: Topsoil and seed new or disturbed slopes and other areas directed by the Engineer. Track the soil and apply seed, mulch, fertilizer, and water. Provide a living ground cover on slopes as soon as possible.

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

Mulch Subsection 727-2.01

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

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

618-3.03 APPLICATION. Delete the second and third paragraphs and add the following. Apply seed, mulch, and fertilizer as follows ***delete***. Apply seed and mulch in one application if using the hydraulic method.

Component	Ingredients	Application Rate (per MSF)
Seed	Wildflower Seed Mix As per Table 724-1	0.60 lbs
Soil Stabilizer Slope ≤ 3:1 Slope >3:1	 Mulch Mulch with tackifier	 46 lbs. 45-58 lbs.
Fertilizer	20-20-20	12.0 lbs.

Do not remove the required tags from the seed bags.

618-3.04 PLANT ESTABLISHMENT AND MAINTENANCE. Add the following: Water seeded areas as required for proper germination and growth.

delete

Fertilizing. Apply first application of fertilizer 30 or more days after the application of the seed and mulch. Fertilizer shall be reapplied the following season with water between May 31 and September 1 at a rate of one-half the initial application to areas as shown on Plans during the maintenance period.

Watering during establishment.

Ensure that the seeded areas stay moist during germination and seedling establishment (as defined by the grass plants attaining a height of approximately 3 inches). Be prepared to water the seeded areas 3 times a day if weather conditions warrant it, until seedlings have become established.

If the Contractor fails to apply adequate moisture during the germination period for 4 consecutive days, or after 2 notices without immediate response, the Engineer may declare affected seeding unacceptable. The Contractor will be required to reseed areas that have not been kept moist.

The Contractor shall isolate portions of each detention basin as necessary to prevent undo inundation and ensure the establishment of the turf, or as directed by the Engineer. (ANH, 04/29/05)

Maintenance period.

The maintenance period shall be one full growing season following their acceptance. One full growing season shall be defined as the period between May 1 and September 30 for the purpose of this Contract. Partial growing seasons will not be counted against the one full growing season requirement.

The Contractor shall repair any damage to seeded areas within their respective maintenance periods upon request by the Engineer.

618-4.01 METHOD OF MEASUREMENT. Add the following: The amount of mulch, and fertilizer in this work, including any required reseeding, will be subsidiary to seeding and will not be measured separately for payment.

618-5.01 BASIS OF PAYMENT. Add the following: Partial payments shall be made at 40% upon seeding, 30% at the end of the first growing season in which seeding is done (first season's maintenance) and 30% upon final acceptance.

delete

Water required for the hydraulic method of application is subsidiary to seeding.

(11/06/02)R52M98

Addendum No.1
Attachment No. 10

SECTION 620

TOPSOIL

Special Provisions

620-2.01 MATERIALS. Add the following: Provide topsoil for areas to be seeded. Areas to be seeded are shown on the typical sections and elsewhere in the drawings. Topsoil for landscape items shall meet the requirements of subsection 621-2.05, Backfill Mix.

620-3.01 PLACING. Add the following: Prepare slopes for seed by "walking" a dozer transversely up and down the slopes, or by grading with a scarifying slope board, as determined by the Engineer. The resultant indentations shall be perpendicular to the fall of the slope. Complete slope preparation as soon as topsoil is placed on the slopes. Rounding the top and bottom of the slopes is acceptable to facilitate tracking and to create a pleasing appearance, but do not disrupt drainage flow lines.

620-4.01 METHOD OF MEASUREMENT. Add the following: **Measurement will be by the square yard regardless of the thickness.** Limestone, if required, will not be measured for payment, but will be subsidiary to Item 620(1), Topsoil. (11/06/02)R53USC02

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

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

SECTION 621

PLANTING TREES AND SHRUBS

Special Provisions

621-1.01 DESCRIPTION. Add the following: **This work shall also include relocation of decorative masonry pilasters and preparation of planting beds including furnishing and installing backfill mix, shredded wood mulch, weed barrier geotextile, plastic landscape edging, and boulders as shown on the Plans.**

621-2.04 MULCH. Delete and substitute the following: For use as ground cover in landscape beds as shown on Plans. It shall consist of shredded wood fibers with the characteristics of retaining moisture and forming a mat so as not to be disturbed by wind or rain. Shall not contain individual components greater than 2 inches in length with a minimum of 75 percent of the total mulch component passing through a 1 inch screen. Mulch shall contain no growth or germination inhibiting ingredients. Locally harvested shredded wood fibers shall be aged for one-year minimum prior to installation. Commercially available shredded wood fiber landscape mulch may be used, provided any added color shall be a natural dark brown. "Green" or "fresh" wood chips are not acceptable. It shall not contain resin, tannin, or other compounds in quantities that are detrimental to plant life.

621-2.05 BACKFILL MIX. Delete and substitute the following: Topsoil used for backfill in planting beds shall consist of a natural friable surface soil without admixtures of undesirable refuse or foreign materials. It shall be free from roots, hard clay, noxious weeds, tall grasses, brush, sticks, stubble or other litter, and shall be free draining and non-toxic. Local red loam or imported peat mix having the nutritional and gradation requirements may be used. Topsoil Backfill shall have 10 to15 percent organic matter as determined by loss-on-ignition of oven dried samples according to ATM 203, and shall meet the following:

Sieve Designation	Percent Passing by Weight
¾ inch	100
No. 4	95-100
No. 16	30-55
No. 200	25-55

621-3.03 PLANTING. Delete Item 1, Plant Season and substitute the following:

1. Plant Season. Plant only during periods which are normal for such work, and as determined by the season, weather conditions and accepted practice. The following planting period shall be followed.

   June 1-September 15

Add the following subsections:

621-2.08 WEED BARRIER GEOTEXTILE. All planting beds, as shown on the plans, shall receive a weed barrier geotextile beneath the mulch. The weed barrier shall meet the requirements of Table 621-1, Weed barrier.

Table 621-1
WEED BARRIER

Geotextile Property	Test Method (ASTM)	Test Value
Grab Tensile Strength, lbs., min.	D-4632	70
Grab Elongation, (at 35 lbs. tensile strength) percent, max.	D-4632	<50
Bursting Strength, psi, min.	D-3786	115
Water Permittivity 1/sec., min.	D-4491	0.04
Apparent Opening Size, max.	D-4751	No. 50
Ultraviolet Degradation at 500 hour exposure, % strength retained	D-4355	70
Geotextile Acceptance, pass or fail	D-4759	Pass

Notes:
1. Geotextile Property Values = Minimum average roll values at a 95% confidence level in the weaker principal direction.

Seams shall be overlapped 12 inches and cut for plants. Submit a 12 inch x 12 inch sample to Engineer for approval before installation.

621-2.09 EDGING. Plastic edging shall be pure polyethylene with 3-1/2 to 4 percent carbon black concentrate added for ultraviolet stabilization, medium density with a melt factor under 2. Average wall thickness shall be 95/1000 to 105/1000 inch, height of 5 inches, with a 1 inch round top and 4 groove base. Install per manufacturer's specifications, straight, level and secure.

621-5.01 BASIS OF PAYMENT. Add the following: **Furnishing and installing of trees, shrubs, backfill mix, shredded wood mulch, weed barrier geotextile, plastic landscape edging, boulders, and relocating decorative masonry pilasters will not be paid for separately but will be included under Item 621(12), Landscaping. Topsoil and seeding will be paid under items 620(1) and 618(2) respectively.**

Add the following pay item:

Pay Item	**Pay Unit**
621(12) Landscaping	Lump Sum

SECTION 627

WATER SYSTEM

Special Provisions

627-1.01 DESCRIPTION. Add the following to the first paragraph: In conjunction with working around and/or adjusting the water valve boxes, the Contractor shall exercise due care. Prior to commencement of work by the Contractor, the Water Utility shall check and correct deficiencies that may exist in any valve or valve box. The Engineer and Contractor shall witness the condition and location of each valve or valve box. Failure to participate in the inspection by the Contractor will result in his forfeiting all rights to deny damages at a later date during the course of the work. Notice that the Contractor is ready for the above inspection shall be in writing to the Water Utility and shall be submitted giving at least 48 hours notice. The Contractor shall furnish a copy of the notice to the Engineer. The Contractor shall provide all traffic control for the inspection of utilities.

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

Raise existing well casings and grade as shown on the drawings. (ANH, 10/24/05)

627-3.03 FIRE HYDRANTS. Add the following: When adjusting or relocating a fire hydrant, only one barrel extension total will be allowed per hydrant for total extensions of the basic hydrant up to four feet. If the total amount of extension required exceeds four feet, then no more than two barrel extensions will be allowed per hydrant. This may require the removal of an existing barrel extension and installing a new longer barrel extension in place of the existing extension.

On the hydrant relocation, the Contractor should start the relocation at the existing auxiliary gate valve. That existing auxiliary gate valve shall be replaced with a new auxiliary valve. The Contractor shall pressure test and disinfect the relocated hydrant and new hydrant leg piping.

627-3.05 VALVE BOXES. Add the following: Valve stem extensions should be installed when adjusting water valve boxes at the intersection of Wasilla-Fishhook Road and Wampam Circle.

Add the following subsections:

627-3.08 DISCONNECT/RECONNECT/RELOCATE WATER SERVICE. For water services requiring extension, a new continuous Type K copper tubing of the appropriate size, from the main to the right-of-way line shall be installed. Disconnect the

water service at approximately 151+70, right at the main in Indian Circle.

627-3.09 RAISE EXISTING WELL CASING. Add additional well casing to the top of the existing well casing at Station 209 left, make associated modifications to related components, and provide grading as shown on the drawings. All work shall conform to the Alaska Department of Environmental Conservation Drinking Water regulations, 18AAC80, and other applicable codes, including but not limited to the National Electrical Code. (ANH, 10/24/05)

627-4.01 METHOD OF MEASUREMENT. Add the following:

6. Disconnect/Reconnect/Relocate Water Service. By the linear foot of any diameter service pipe constructed in final position, measured along the slope of the new water service pipe from the center of the main at the new connection point to the service reconnection point. The minimum length for payment will be 10 feet.

7. Disconnect Water Service. By each water service disconnected at the main. In order to be measured for payment, disconnecting the service must be specifically called out on the Plans or be directed by the Engineer. This item pays for disconnections from water mains that will remain in operation following construction, and where the disconnection is in a remote location away from reconnection work on the same service.

   Water services disconnected as a portion of Disconnect/Reconnect/Relocate Water Service described in the paragraph above, will not be measured for separate payment under this pay item.

8. Raise Existing Well Casing. By each well casing raised. Grading around the well casing is subsidiary. (ANH, 10/24/05)

627-5.01 BASIS OF PAYMENT. Add the following:

Disconnect/Reconnect/Relocate Water Service. Payment includes materials, labor, and equipment needed to complete each installation.

For services less than or equal to 2 inches in diameter, curb stops, key boxes, service pipe, all fittings, and connections to a new or existing water main with a service saddle, tapped coupling and/or corporation sop are subsidiary. Standard modifications to keyboxes including new heavy duty cotter pins for keybox are subsidiary.

For services larger than 2 inches in diameter, fire line restraint, thrust blocks, any live taps that may be necessary to connect to a new or existing water main and required fittings, bends, and service saddles are subsidiary. Service valves and valve boxes larger than 2 inches will be measured and paid for under their respective pay items.

Valve stem extensions, when required, will not be paid for directly, but will be

subsidiary to Item 627(10), Adjustment of Valve Box.

Add the following pay items:

Pay Item	**Pay Unit**
627(8c) Disconnect Water Service	Each
627(13A) Disconnect/Reconnect/Relocate Water Service	Linear Foot
627(37) Raise Well Casing	Each

Addendum No.1
Attachment No. 11

SECTION 635

INSULATION BOARD

Special Provisions

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

Sand blanket material is subsidiary. (08/23/00)R57USC

635-5.01 BASIS OF PAYMENT. Add the following: Payment will be made under:

Pay Item	Pay Unit
635(2) Insulation Board, R20	Square Foot

Delete this Section in its entirety and substitute the following:

SECTION 639

DRIVEWAYS

Special Provisions

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

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

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

639-4.01 METHOD OF MEASUREMENT. By the number of driveways and approaches constructed as shown on the Plans or as directed.

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.

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

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

Payment will be made under:

Pay Item	Pay Unit
639(6) Approach	Each

SECTION 641

EROSION, SEDIMENT, AND POLLUTION CONTROL

Special Provisions

641-1.02 DEFINITIONS. Item 1. add the following to the end of the last sentence: BMP: Add " , most recent revisions."

Item 2.Add "The ESCP is included in Appendix A."

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

Item 6 Change EPA Form number to 3510-13.

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

Special Provisions

Replace subsection 641-1.03 with the following:

641-1.03 SUBMITTALS. For projects that disturb one acre or more of ground submit three copies each of the SWPPP and HMCP to the Engineer for approval. Submit one copy of the SPCC Plan (if required under subsection 641-2.03) to the Engineer. Sign submittals. Deliver these documents to the Engineer no less than five calendar days before the preconstruction conference.

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

For regular U.S. Mail delivery:

EPA Storm Water Notice Processing Center
Mail Code 4203M
U.S. EPA
WASILLA-FISHHOOK ROAD
STP-0525(13)/56912

For Overnight/Express mail delivery:

EPA Storm Water Notice Processing Center

Room 7420
U.S. EPA

1200 Pennsylvania Avenue, NW
NW
Washington, D.C. 20460

1201 Constitutional Avenue,

Washington, D.C. 20004

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

Delete paragraphs 3 and 4 and add the following:
The Contractor shall not begin ground disturbing activities until the Engineer has issued the Contractor a written statement that the EPA has listed the Contractor's NOI and the Department's NOI as active.

The Department will submit the approved SWPPP to ADEC that will include both the Contractor's and Department's NOIs. The Department will transmit the Department's NOI to the EPA."

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

Delete paragraph 6, and substitute the following: "When the Contractor receives written notice from the Department that the project is stabilized, submit signed NOT to EPA with a copy to the Engineer. The Department will transmit the Department's NOT to the EPA.

641-2.01 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS.
Add following to the end of the third sentence: "most recent revisions.", for projects disturbing 5 acres or more.

Replace subsection 641-3.01 with the following:

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

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

Comply with requirements of the approved HMCP, the submitted SPCC Plan, and state and federal regulations that pertain to the handling, storage, cleanup, and disposal of petroleum products or other hazardous substances. Contain, clean up, and

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

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

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

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

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

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

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

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

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

3. Inspection Reports. Prepare and submit, within three working days of each inspection, a report on state Form 25D-100, with the following information:

a. A summary of the scope of the inspection.
b. Name(s) of personnel making the inspection.
c. The date of the inspection.
d. Observations relating to the implementation of the SWPPP.
e. Any actions taken as the result of the inspection.
f. Incidents of noncompliance.

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

Retain copies of the SWPPP and all other records required by the NPDES General Permit, for at least three years from the date of final stabilization.

If unanticipated or emergency conditions threaten water quality, take immediate suitable action to preclude erosion and pollution.

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

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

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

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

1. Upon receipt of written notification from the Engineer the project site (including material sources, disposal sites, etc.) has been finally stabilized and storm water discharges from construction activities authorized by this permit have ceased, or

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

If the Contractor fails to coordinate temporary or permanent stabilization measures with the earthwork operations in a manner to effectively control erosion and prevent water pollution, the Engineer may suspend earthwork operations and withhold monies due on current estimates for such earthwork items until all aspects of the

work are coordinated in a satisfactory manner.

If the Contractor fails to:

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

or

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

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

Replace subsection 641-5.01 with the following:

641-5.01 BASIS OF PAYMENT.

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

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

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

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

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

Permanent erosion and pollution control measures will be measured and paid for under other contract items, when shown on the bid schedule. R272USC05(07/05/05)

Payment will be made under:

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

SECTION 642

CONSTRUCTION SURVEYING AND MONUMENTS

Special Provisions

642-1.02 DEFINITIONS: Add the following definition:

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

642-2.01 MATERIALS. Add the following:

Digital Measuring Instrument: Nu-metrics, Nitestar DMI (www.nu-metrics.com)

642-3.01 GENERAL. Add the following:

11. Measure and document available passing sight distance along the roadway in both directions of travel. Measure this after the paving, guardrail, and other work affecting passing sight distance has been completed. Use Table 642-1 to establish Minimum Passing Sight Distance. Move forward alongside the centerline or edge of traveled way in order to spot check and discover locations where the Minimum Passing Sight Distance drops below what is required for 10 MPH over the posted speed limit. Record the sight distance for each station location that falls below the posted speed limit plus 10 MPH. Continue to record the sight distance for each station location until the sight distance drops below what is required for the posted speed limit. Stations observed to exceed the values required for posted speed limit plus 10 MPH should be marked as "Pass" or "+". Stations observed to fall below the values required for the posted speed limit should be marked as "Fail" or "-".

    Measure from the roadway edge of traveled way, using a 3.5-foot object height (or "instrument height") at 100-foot station marks looking ahead to a 3.5-foot target height at the edge of traveled way for opposing traffic. Provide a list of each station result for each direction of travel along the roadway edge of traveled way. Certify and record the results on standard "letter" sized paper and provide two (2) copies to the Engineer at least two weeks before laying out final pavement markings.

    The Engineer will forward one copy to the Regional Traffic Engineer. Table 642-1 does not automatically ensure passing striping will be provided. The Regional Traffic Engineer's office will take up to two weeks to review and approve pass/no-pass striping against operating speeds for the roadway before installation, using Table 642-1 and the Alaska Traffic Manual as a guide.

No-pass striping zones shall be at least 500 feet in length. Passing striping shall be long enough to meet the distances in Table 642-1. Passing striping will not extend into a segment of road without minimum sight distance.

TABLE 642-1
PASSING SIGHT DISTANCE

Operating Speed (mph)	Minimum Passing Sight Distance (ft)
15	220
20	295
25	365
30	440
35	515
40	585
45	660
50	735
55	805
60	880
65	955

Passing Sight Distance Survey Table

ROAD NAME: _____

Stationing FROM: _____

DATE: _____

TO: _____

Surveyor: _____

Project Station	Posted Speed Limit	Direction of Travel	Sight Distance Ahead	Remarks

Other Notes:

1.
2.
3.

Accepted By: _____ Date: _____

DOT/PF Project Engineer

Passing Sight Distance Review Checked By: _____ Date: _____

DOT/PF Regional Traffic Engineer

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

Replace the second sentence in item 2 with the following: **Take cross sections before grubbing and before removal work has been completed.**

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

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

Keep records and report to the Project Engineer evidence that a monument has been disturbed and is no longer reliable or cannot be located and is presumed to be lost or obliterated. Establish a minimum of two in-line reference points to all monuments identified for referencing on the Departments Right-of-Way plans or Survey Control sheet. In situations where in-line references are not practical three swing-tie reference points will be accepted. Set references outside of the Right-of-Way limits. Measure all distances to the nearest 0.01 foot. Record referencing of monuments in a separate field book stamped by the Surveyor. It is the Surveyors statutory responsibility to reference any other monuments that may be destroyed during construction whether or not they are identified on the Right-of-Way plans or Survey Control sheet. Without prior written approval of the Survey Manager for the Region in which the project is located, the use of GPS is not an acceptable method for referencing monuments.

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

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

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

642-4.01 METHOD OF MEASUREMENT. Add the following:

Item 642(16) Passing Sight Distance Measurement. By the number of stations on the project measured separately along centerline, once for each direction, only after the certified and recorded results have been accepted by the Engineer.

642-5.01 BASIS OF PAYMENT. Add the following pay item:

Pay Item	**Pay Unit**
642(16) Passing Sight Distance Measurement	Station

(07/05/05)R61USC02

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. (04/04/05)#48

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 the "No Lighting Required" period shown in the table below:

Latitude	**No Lighting Required**		**Nearby**
(degrees)	**Start**	**End**	**Cities**
< 61	Lighting Required All Year		Everything South of Hope
61	June 11	July 1	Anchorage, Valdez, Girdwood
62	June 2	July 13	Wasilla, Palmer, Glennallen, Talkeetna
63	May 27	July 17	Cantwell, Paxson, McGrath
64	May 22	July 21	Tok, Delta, Nome
65	May 18	July 25	Fairbanks
66	May 14	July 29	Circle City
67	May 10	August 2	Coldfoot, Kotzebue
68	May 7	August 6	Galbraith Lake
69	May 3	August 9	Happy Valley
70	April 30	August 12	Deadhorse
71	April 27	August 15	Barrow
72	April 24	August 19	

(04/04/05)#48

Add the following: ASDS. Alaska Sign Design Specifications, latest edition. (ANH 11/15/04)

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

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

i. Supervise lighting of Night Work

(04/04/05)#48

643-2.01 MATERIALS. Add the following:

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

Standard Modifications

643-3.01 GENERAL CONSTRUCTION REQUIREMENTS. Add the following: Immediately notify the Engineer of a traffic related accident that occurs within the project limits as soon as becoming aware of the accident. (02/05/04)E10

Special Provisions

643-3.01 GENERAL CONSTRUCTION REQUIREMENTS. Add the following: Whenever construction activity encroaches onto the safe route in a traffic control zone, station a flagger at the encroachment to assist pedestrians and bicyclists past the construction activity.

643-3.02 ROADWAY CHARACTERISTICS DURING CONSTRUCTION. Add the following: Traffic may be maintained on a continuous gravel surface for the length of the active phase.

Standard Modification

643-3.04 TRAFFIC CONTROL DEVICES.

In the sixth paragraph, delete the words "ATTSA" and replace with "ATSSA". (06/30/04)E16

Special Provisions

643-3.04 TRAFFIC CONTROL DEVICES. Delete the first sentence of the eighth paragraph and substitute the following: Items paid under this Section remain the

Contractor's property unless stated otherwise.

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

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

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

Delete item 6 and replace with the following:

6. Street Sweeping. Keep free of loose material paved portions of the roadway and haul routes open to the public, including sections of roadway off the project where the Contractor's operations have deposited loose material using a street sweeper that can collect materials rather than eject them to the shoulder of the road.

7. Power Brooming. Keep free of loose material paved portions of the roadway and haul routes open to the public, including sections of roadway off the project where the Contractor's operations have deposited loose material using a power broom that can eject them to the shoulder of the road.

Change items 7 and 8 to 8 and 9 respectively.

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 of the ET-2000 LET unit(s). After a one time use, 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 to the first paragraph: Failure to maintain an acceptable infrastructure or traffic control plan will result in a price adjustment equal to 100 percent of the applicable rate shown in Table 643-1, for the time the roadway or pedestrian facility is in an unacceptable condition.

Delete Table 643-1 and substitute the following:

TABLE 643-1
ADJUSTMENT RATES

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

643-3.08 CONSTRUCTION SEQUENCING. Delete the last sentence and substitute the following: Unless otherwise determined by the Engineer and on an approved Traffic Control Plan (TCP), do not restrict traffic between 0530 and 0800, Monday through Friday.

Lane restrictions, if allowed shall be conducted so that no more than a 5 minute accumulated stopped delay, 20 vehicles, or 500 feet of traffic is detained, whichever occurs first, before releasing the detained motorists. During paving operations a 10 minute stopped delay, 80 vehicles, or 1/4 mile (2,640 feet) of traffic detained, will be allowed for motorists except school buses. If a queue of traffic develops at a stop, the entire queue must be emptied to include the last car that entered the queue at the time the queue was released.

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

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

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

Add the following new subsection:

643-3.10 LIGHTING OF NIGHT WORK. Illuminate the night work areas specified in Table 643-2 to the light levels specified.

Table 643-2 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 or Equipment	**Lighting Configuration**
Paving, Milling, Striping, Pavement Marking Removal, Rumble Strip Installation	At least 2 machine-mounted balloon lights with a cumulative wattage of at least 4000 watts. Provide additional lights or wattage if necessary to provide complete coverage.
Rolling, pavement sweeping	At least 4 sealed beam halogen lamps in the front and four in the back. Each should be at least 55 watts.
Flagging	One light plant with 4 - 1000 watt metal halide lamps illuminating the flagger located within 50' of the normal flagger location. Orient to avoid creating glare for drivers.
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 traffic 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.

Install lighting in a manner that minimizes glare for motorists, workers, and residents living along the roadway. Locate, aim, louver, and/or shield light sources to achieve this goal. When feasible, orient floodlights at 90 degrees to the direction of traffic flow.

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 provide required lighting equipment or provides lighting that creates unacceptable glare at any time, the Contractor shall cease the operation that requires illumination 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. Locate mounting brackets and fixtures so they don't interfere with the equipment operator or overhead structures. Connect fixtures securely in a manner that minimizes vibration.

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

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

Furnish each side of non-street legal equipment with a minimum of 75 square inches high intensity retroreflective sheeting in each corner, so at least 150 square inches of sheeting is visible from each direction. Provide red sheeting on the rear of the equipment and yellow sheeting elsewhere.

Existing street and highway lighting and conventional vehicle headlights do not eliminate the need for the Contractor to provide lighting meeting the requirements of Table 643-2.

Provide sufficient fuel, spare lamps, spare generators, and qualified personnel to ensure that all required lights operate continuously during nighttime operations. Ensure generators have fuel tanks of sufficient capacity to permit operation of the lighting system for a minimum of 12 hours. In the event of any failure of the lighting system, discontinue the operation that requires illumination until the required level and quality of illumination is restored.

Maintain a supply of at least twenty emergency flares for use in the event of emergency or unanticipated situations. Comply with local noise ordinances.

Provide NCHRP 350-compliant breakaway bases for all post-mounted electroliers located within the clear zone.

(04/04/05)#48

Standard Modification

Add the following new subsection:

643-3.11. HIGH VISIBILITY CLOTHING. Ensure all workers within project limits wear an outer visible surface or layer that complies with the following requirements:

1. Tops. Wear fluorescent vests, jackets, or coverall tops conforming to Class 2 at all times. Class 2 requires at least 775 square inches of conforming fluorescent red-orange background material and at least 201 square inches of

conforming retroreflective striping. Retroreflective striping shall be fluorescent yellow-green combined-performance material.

The vest, jacket, or coverall top shall have two over the shoulder combined-performance retroreflective stripes, and at least one 360-degree horizontal combined-performance retroreflective stripe around the torso. Jackets and coverall tops shall have two horizontal combined-performance retroreflective bands on each sleeve; one above and one below the elbow.

2. Bottoms. Wear fluorescent red-orange Class E pants or coverall bottoms during nighttime work (sunset to sunrise). Flaggers shall wear fluorescent red-orange Class E pants or Class E coverall bottoms at all times. Furnish each garment with two 2-inch wide combined-performance fluorescent yellow-green retroreflective horizontal stripes on each leg.

3. Raingear. Raingear tops and bottoms, when worn as the outer visible surface or layer, shall conform to the requirements listed above in (1) Tops and (2) Bottoms.

4. Exceptions. When workers are inside an enclosed compartment of a vehicle, they are not required to wear high visibility clothing.

5. Standard. All high visibility garments shall conform to the requirements of ANSI 107-1999 as well as this specification. Class 2 and Class E garment requirements are defined in that standard. All retroreflective material must also qualify as combined-performance fluorescent material.

6. Labeling. All garments shall be labeled in conformance with Section 10.2 of ANSI-107-1999.

7. Condition. Furnish and maintain all vests, jackets, coveralls, rain gear, hard hats, and other apparel in a neat, clean, and presentable condition.

(12/02/03)E07

Special Provisions

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

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

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 item:

16. Work Zone Illumination. Payment for work zone illumination and any required adjustments to work zone illumination is subsidiary to other items. (04/04/05)#48

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

The Engineer will pay for Item 643(15), Flagging on a contingent sum basis at the rate of $38/hour. The Engineer does not require a change order/directive for the flagging pay item. Flagging associated with Change Order work will be paid at the prices agreed to in the Change Order, or on a time and materials basis according to subsection 109-1.05.

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

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

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

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

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

TRAFFIC CONTROL RATE SCHEDULE

Traffic Control Device	Pay Unit	Unit Rate
Construction Signs	Each/Day	$5.00
Special Construction Sign	Square Foot	$20.00
Type II Barricade	Each/Day	$ 3.00
Type III Barricade	Each/Day	$ 10.00
Traffic Cone or Tubular Marker	Each/Day	$ 1.00
Drums	Each/Day	$ 3.00
Sequential Arrow Panel	Each/Day	$55.00
Portable Concrete Barrier	Each	$60.00
Temporary Crash Cushion / ET-2000 LET	Each	$3,000.00
Pilot Car	Hour	$65.00
Watering	M-Gallon	$ 20.00
Street Sweeping	Hour	$150.00
Power Broom	Hour	$75.00
Plastic Safety Fence	Foot	$2.50
Portable Changeable Message Board Sign	Calendar Day	$150.00
Temporary Sidewalk Surfacing	Square Foot	$1.15
Flexible Markers	Each	$50.00
Removal of Pavement Markings	Foot	$1.25
Temporary Guardrail	Foot	$21.00
Interim Pavement Markings		
Painted Markings	Foot	$0.30
Removable Preformed Markings	Foot	$0.65
Temporary Raised Pavement Markings	Each	$0.90
Word or Symbol Markings	Each	$40.00
Preformed Marking Tape	4"X 1 Foot	$1.50

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

Pay Item	**Pay Unit**
643(15) Flagging	Contingent Sum

(08/04/05)R222USC04

SECTION 644

SERVICES TO BE FURNISHED BY THE CONTRACTOR

Special Provisions

644-2.01 FIELD OFFICE. Delete this subsection in its entirety and substitute the following: Furnish and maintain a suitable office for the Engineer, available for occupancy from 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. (11/19/02) R63USC

644-2.05 VEHICLES. Delete the second and third paragraphs and substitute the

following: Furnish three (3) full-size four-wheel drive pickup(s) or sport utility vehicle(s) for exclusive use of the Department throughout the project. Provide vehicles less than three (3) model years old, in good condition and with less than 36,000 miles on the odometer.

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

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

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

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

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

644-4.01 BASIS OF PAYMENT. Add the following pay item:

Payment will be made under:

Pay Item	Pay Unit
644(8) Vehicle	Each

(02/03/03)R245USC

SECTION 646

CPM SCHEDULING

Special Provisions

646-2.01 SUBMITTAL OF SCHEDULE Replace this subsection with the following: Submit a detailed initial CPM Schedule at the preconstruction conference for the Engineer's acceptance as set forth below.

The construction schedule for the entire Project shall not exceed the specified contract time. Allow the Engineer 14 days to review the initial CPM Schedule. Revise promptly. The finalized CPM Schedule must be completed and accepted before beginning work on the Project.

646-3.01 REQUIREMENTS AND USE OF SCHEDULE. Delete item 2. 60-Day Preliminary Schedule.

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

Add the following Section:

SECTION 647

EQUIPMENT RENTAL

Special Provisions

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

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

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

The kinds, sizes, capacities, and other requirements set forth shall be understood to be minimum requirements. The number of pieces of each equipment to be furnished and used shall be as the Engineer considers necessary for economical and expeditious performance of the work. The equipment shall be used only at such times and places as the Engineer may direct.

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

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

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

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

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

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

Normally, the work is to be done when weather conditions are reasonably favorable, 6 days per week, Mondays through Saturdays, holidays excepted.

The Engineer will begin recording time for payment each shift when the equipment begins work on the project. The serial number and brief description of each item of equipment listing in the bid schedule and the number of hours, or fractions thereof to the nearest one-quarter hour, during which equipment is actively engaged in construction of the project shall be recorded by the Engineer Each day's activity will be recorded on a separate sheet or sheets, which shall be verified and signed by the Contractor's representative at the end of each shift, and a copy will be provided to the Contractor's representative.

647-4.01 METHOD OF MEASUREMENT. The number of hours of equipment operation to be paid for shall be the actual number of hours each fully operated specified unit of equipment, or each fully operated specified combination of units of equipment, is actually engaged in the performance of the specified work on the designated areas in accordance with the instruction of the Engineer. The pay time will not include idle periods, and no payment will be made for time used in oiling, servicing, or repairing of equipment, or in making changeovers of parts to the equipment. Travel time to or from the project, will not be authorized for payment.

647-5.01 BASIS OF PAYMENT. Payment for Item 647(1), Wide Pad Dozer, 65 hp Minimum will be paid on a contingent sum basis at the rate of $125/hour on a per hour basis at the rate shown on the bid schedule. This shall be full compensation for furnishing, operating, maintaining, servicing and repairing the equipment, and for all incidental costs related to the equipment. Furnishing and operating of equipment of heavier type, larger capacity, or higher wattage than specified will not entitle the Contractor to any extra compensation.

Payment will be made under:

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

(08/24/05)R15USC

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.

   b. 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

660-3.01 GENERAL. Delete items 3, 4, 5, 7, and 8 in their entirety and substitute the following:

3. Excavating and Backfilling. Complete all excavation and backfill required to install the signal and lighting components embedded in the roadway as shown in the Plans, including foundations, conduits, and junction boxes. 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 encountered during excavation.

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

   To install conduits, excavate trenches deep enough to allow for six inches of bedding material, the depth of the largest conduit, and the minimum burial depth specified between the top of the conduit and finished grade of the ground above the conduit. Keep the longitudinal profile of trench bottoms free of irregularities that would prevent the assembled conduit run from continuously contacting the top of the bedding material.

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

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

a. Around formed foundations, 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 in which it is located, reusing excavated materials if it meets the requirements of the applicable lift,

c. In all other locations, embed conduits and backfill trenches using material that meets the requirements of Selected Material, Type C, reusing excavated materials if it meets this requirement.

d. Import, when ordered, embedment and backfill materials that satisfy the preceding materials requirements.

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

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

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

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

Repair the holes, which were used to mount equipment, in reused poles and mast arms by welding in disks flush with the adjoining surface. For the disk material, use steel that matches the ASTM designation, grade, and thickness of the steel used to fabricate each pole. Cut disks that match the dimensions of the hole being repaired from pieces of steel plate bent to match the pole's radius at the hole. Grind the welds smooth and flush with the adjoining pole and disk surfaces. Repair the damaged finish according to subsection 660-3.01.8.

5. Removing and Replacing Improvements. Complete the following work at your expense.

a. Remove all improvements that block completion of the work detailed in the Plans as specified herein.

b. Reconstruct with new materials the nonreusable improvements you remove to complete the work, unless other items in the contract cover the improvement.

c. Replace with new materials the reusable items you damage, which are specified for reuse.

d. Reconstruct with new materials all improvements you damage or remove, which do not conflict with the work and are not scheduled for removal.

Nonreusable improvements consist of cast in place items, including: asphalt concrete pavement, sidewalks, curb and gutter, lawns, and traffic markings. Reusable improvements include the items that were made before they were installed. You may not, however, reuse crushed aggregate base material as backfill in the base course if excavation depth exceeds the thickness of the base course.

Complete all reconstruction work, including materials, according to the applicable sections of the Alaska SSHC, and leave the work in a satisfactory and serviceable condition. In completing the reconstruction work, match the alignments, widths, thicknesses, shapes, sizes, cross sections, and finishes of the existing improvements.

If you remove a portion of sidewalk or curb and gutter, remove an entire segment between the weakened plane contraction joints or between an expansion joint and a weakened plane contraction joint.

Before removing a segment of Portland or asphalt cement concrete material, cut completely through the material with a saw along the outline of the area to be removed. Make cuts neat and true and prevent shatter outside the area removed.

To replace lawns, leave the top of the backfilled excavation low enough to install four inches of compacted topsoil. Match the top of the topsoil with the bottom of the vegetative mat. Apply seed and keep the seeded areas watered according to Section 618.

Remove, keep alive, and replant trees, shrubs, and plants according to Section 621. Replace the trees, shrubs, and plants that do not survive with plants of like size and type.

6. **(standard specifications apply)**

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.

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 you put the equipment into service. Repair the damaged finishes found according to the following:

a. Galvanized. Repair damaged areas more than 12-inches away from welds and slip fit areas, by applying a minimum 7.8 mils of zinc-based alloy applied according to ASTM A780.

If the damaged areas are within 12-inches of welds and slip fit areas, make the repair by applying a minimum 7.8 mils of zinc-rich paint applied according to ASTM A780.

b. Painted. Repair damage to painted finishes according to the following

(1) Wash the equipment with a stiff bristle brush using a solution containing two tablespoons of heavy-duty detergent powder per gallon of water. After rinsing, wire brush surfaces to remove poorly bonded paint, rust, scale, corrosion, grease, or dirt. Remove dust or residue remaining after wire brushing before priming.

(2) Factory or shop cleaning methods may be used for metals if equal to the methods specified herein.

(3) Immediately after cleaning, coat bare metal with pre-treatment, vinyl wash primer, followed by 2 prime coats of zinc chromate primer for metal.

(4) Give non-galvanized standards 2 spot-finish coats on newly primed areas.

Paint coats may be applied either by hand brushing or by approved spraying machines. Perform the work in a neat and workmanlike manner. The Engineer reserves the right to require the use of brushes for the application of paint, should the work done by the paint spraying machine prove unacceptable.

Add the following new item 9:

9. Regulations and Code. Complete all work according to the standards of the NEC, the NESC, and local safety codes as adopted and amended by the authority having jurisdiction.

660-3.02 FOUNDATIONS. Under item 1. Cast-in-Place Foundations., add the following to the first paragraph: Locate the tops of all pole foundations flush with the adjacent finished: walkway, shoulder, or surrounding ground.

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

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

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

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

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

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

After torquing the top nuts, use a hydraulic wrench to rotate all top nuts an additional one third (120^{0}) turn, while preventing the leveling nuts from turning.

l. Attach a 4 AWG, bare, solid copper wire as a grounding electrode conductor to the #4 spiral bar in the reinforcing steel cage. Use an irreversible compression connector or cadweld to make the attachment. Protect the attachment during concrete placement. In foundations that lack reinforcing steel cages, install 21 feet of coiled 4 AWG, bare, solid copper wire as the grounding electrode. Route the conductor to protrude near the top, center of the foundations. Slide a minimum 6 inch long, nonmetallic, protective sleeve over the conductor. Allow 1 inch of the sleeve and 24 inches of conductor to protrude from the foundations.

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

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

Replace subsection 660-3.03 with the following:

660-3.03 CONDUIT. Electrical conductors shall be installed in conduit, except for overhead wiring, wiring inside poles, and when otherwise specified. Use rigid metal conduits (RMC) and fittings for raceways, including bored casings, except 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. 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.

7. Coat drilled holes, shop and field cut threads, and the areas with damaged zinc coating with zinc rich paint.

8. When standard couplings cannot be used to join conduit components, use approved threaded unions.

9. 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.

10. If encountering obstructions during jacking or drilling operations, obtain approval and cut small holes in the pavement to clear the obstruction. Locate the bottom inside face of the bore pit no closer than the catch point of a 1¼ to 1 slope (a horizontal to vertical ratio) from the edge of pavement. Do not leave these pits unattended until installing an approved means of protection.

11. 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.

12. 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.

13. 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.

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

15. 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.

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

17. 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.

18. 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.

19. 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.

20. 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.

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

Replace subsection 660-3.04 with the following:

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

LIGHTING inscribed into them.

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

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

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

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

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

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

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

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

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

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

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

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

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

Delete item 3 in its entirety and substitute the following:

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

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

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

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

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

sustain combustion.

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

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

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

Add the following items:

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

19. Whenever conductors can not be terminated as specified in the Plans in circuit breakers due to size, splice a piece of #8 AWG power conductor onto the end of each conductor using an overlap type, irreversible compression connector. Insulate the splice with heat shrink tubing. Complete the splice in the space between the top of the load center foundation and the bottom of the cabinet. Limit the length of the #8 AWG conductor to 5 feet.

Replace subsection 660-3.06 with the following:

660-3.06 BONDING AND GROUNDING. Bond and ground branch circuits according to the NEC and the following requirements. Make noncurrent carrying but electrically conductive components, including: metal conduits, junction box lids, cabinets, transformer cases, and metal posts and poles, mechanically and electrically secure to an equipment grounding conductor. Make fixtures mounted on metal poles, including signal components and luminaires, mechanically and electrically secure to the pole.

Install grounding bushings with insulated throats on the ends of metallic conduits.

Install a bare stranded copper wire for the equipment grounding conductor in conduits, except those conduits installed for future use. Install size 8 AWG conductors, except in those conduits that contain circuit conductors larger than 8 AWG. In this case, install a wire equal in size to the largest circuit conductor. Attach the grounding conductors to the grounding bushings, leaving 12 inches of slack between each bushing. Connect grounding conductors together using

irreversible compression type connectors to form a fully interconnected and continuous grounding system.

Retrofit existing spare conduits that will contain new cables exclusively with new grounding bushings. When the Plans require installation or removal of conductors from existing conduits, retrofit with new grounding conductors sized according to the preceding paragraph.

Bond junction box lids to the grounding conductor using copper braid with a cross sectional area equal to an 8 AWG conductor. Connect bonding jumpers to the grounding conductors using irreversible compression type connectors. Replace missing or damaged conduit and junction box lid bonding jumpers.

Join the equipment grounding conductors from the conduits to the 4 AWG grounding electrode conductor using irreversible compression connectors at Portland cement concrete foundations. For pile foundations, attach the equipment grounding conductor from the conduit to the pile cap adapter with a listed mechanical grounding connector.

When installing signal poles, signal posts, and lighting standards with frangible coupling bases, run a 4 feet long grounding conductor from the grounding bushing on the conduit to the grounding lug located in the hand hole of each pole.

Bond slip base type standards and pedestals by using 2 conductors from the conduit, one attached with a ground rod clamp to an anchor bolt and the other connected to the grounding lug located in the hand hole of each pole.

Ground one side of the secondary circuit of a transformer.

Install a ¾ inch by 10 feet copper clad ground rod inside each controller cabinet foundation and a 6 AWG bare stranded copper wire for the grounding electrode conductor.

Replace subsection 660-3.08 with the following:

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

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

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

holes.

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

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

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

1. Electrolier Installation. Before installing electroliers, check the socket position of each luminaire to verify it matches the position indicated in the instructions for the light distribution type shown on the Plans.

   Install electroliers with mast arms with a slight rake by plumbing the side of the pole opposite the mast arm. After the pole has been plumbed, level the luminaire as recommended by the manufacturer.

   Install electroliers without mast arms with the centerline of the pole plumb.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

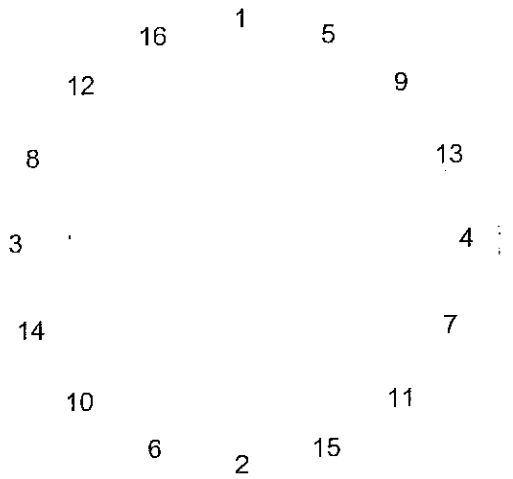
Use steel templates to accurately locate and hold the anchor rods plumb and in proper alignment during concrete placement. Leave this template in place for at least 24 hours after completing concrete placement. The Engineer will reject foundations with anchor rods that are out of position or more than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

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

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

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

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



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

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

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

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

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

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

660-3.09 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS. Delete this subsection in its entirety and substitute the following: This work consists of protecting and maintaining the existing and temporary electrical systems during the life of the contract. The work includes: locating, repairing, replacing, adjusting, realigning, cleaning, and relocating components of traffic signals, lighting systems, and flashing beacons to keep them wholly operational and positioned according to the following specifications.

If the existing lighting systems is not kept fully operational as specified herein, the Engineer will reduce the payments under Item 660(22), Illumination Price Adjustment.

Furnish the Engineer with the name and phone number of the person who will maintain the existing and temporary electrical facilities at the Preconstruction Conference. Make this person available at times until the date of Acceptance for Traffic and Maintenance and provide labor, materials, and equipment this person may need to complete repairs ordered by the Engineer.

When beginning work, the Engineer will notify the Contractor and the local maintenance agencies in writing of the transfer of maintenance responsibilities, providing an effective date and time. Maintenance does not include replacing defective equipment or repairing equipment damaged before the transfer of maintenance responsibility. Therefore, before starting work on the project, inventory the condition of the existing equipment with the Engineer and document the damaged and defective equipment. If beginning work before providing the Engineer with an inventory, the Contractor waives the right to claim extra compensation when the Engineer later finds damaged or defective equipment.

Keep components of the existing and temporary electrical systems operational during the progress of the work, except when the Engineer allows shutdowns to alter or remove the systems. The Engineer will consider these systems operational when no damaged or defective equipment is found in service, components are clean, located, and aligned as specified herein, and photoelectric controls operate the lighting systems. The State will pay for electricity used to operate the systems, if the public benefits from their operation. Furnish replacement equipment compatible with equipment used in the Central Region.

Begin work to repair, replace, adjust, realign, clean, and/or relocate components of an affected system within one hour when ordered by the Engineer. If work is not complete, the Engineer may have outside forces complete the repairs and deduct the amount billed from monies due the Contractor.

Records. When working on a traffic signal system, print a record of work performed in the diary found in each controller cabinet. Make sure each entry includes

1. The dates and times beginning and completing work, and the names of the crewmembers completing the work.

2. The characteristics of the equipment failure or faulty operation evident before repair.

3. The changes made or corrective actions taken.

4. The printed name and signature of the person responsible for making the repairs or changes.

The Engineer will limit signal system shutdowns to the hours traffic restrictions allowed in subsection 643-3.08, Construction Sequencing. During shutdowns, use flag persons to control traffic. Provide local traffic enforcement and maintenance agencies 24 hour notice before shutting down a traffic signal system.

Locate existing conduit runs, buried cables, junction boxes, and underground utilities before starting work that may damage these facilities or interfere with these systems.

Where roadways remain open to traffic and the work includes modifying the existing lighting systems, energize the modified circuit by sunset on the same day the Contractor retires the original circuit.

Relocate or replace signal poles, lighting standards, sign poles, flashing beacon poles, load centers, and controller cabinets whenever reducing clearance from the traveled way to less than 6 feet.

Alignment. During the various phases of construction, shift the signal heads to keep them aligned horizontally and vertically with the approaches according to the following:

1. For overhead signals located 53 feet and more from the stop line, maintain 17.5 feet to 21.5 feet of clearance between the traveled way and the bottom of each signal. For closer signals refer to the MUTCD for maximum clearances.

2. For side mounted signals, maintain nine feet to 11 feet of clearance between the traveled way and the bottom of the signal.

3. Align overhead signals controlling a single lane with the center of the lane.

4. Align overhead signals controlling two or more lanes with the lane lines separating the lanes.

5. When the horizontal angle to the side mounted far right signal exceeds 20°, relocate this signal to an overhead location. Measure the angle 10 feet back from the stop line on the lane line between the two farthest left through lanes.

    i. With two or more through lanes, center one signal head over each lane.

    ii. With one through lane and protected permitted signal phasing, leave

the five section signal over the lane line and center the signal to be relocated over the through lane.

iii. Otherwise, install the relocated signal 8 feet to the right of the signal centered over the through lane.

6. For pedestrian signals, maintain 7 to 9 feet between the traveled way and the bottom of each pedestrian signal.

7. Aim signal heads according to Table 660-2 found in subsection 660-3.08, Signal and Lighting Structures.

When no longer required, salvage original and Department provided equipment according to the Plans and item 6. Salvaging or Reusing Electrical Equipment found in subsection 660-3.01, and remove other materials used in the temporary systems from the project.

Add the following subsections

660-3.11 CONTROLLER CABINENT PREPARATION. Municipality of Anchorage traffic signal personnel will be utilized to perform the following:

Controller Cabinet Preparation. Traffic controller cabinet(s) and equipment shall be shipped to the Municipality of Anchorage Traffic Signal Maintenance Section laboratory at 3650 E. Tudor Road, Building C. The Municipality will inspect cabinet wiring, burn in signal equipment, customize cabinet(s) for desired operation and test in accordance with Subsection 660-3.07, Shop Tests. The Contractor shall execute agreements and directly coordinate this work with the Municipality.

660-3.12 TEMPORARY ELECTROLIERS. When the Contract includes Item 660(40) Temporary Electrolier, install temporary electroliers at the following locations:

1. Along roadway segments that are illuminated when beginning work and the following conditions apply:
   a. Maintaining traffic on the subgrade, portions of the new pavement structure, or on the existing pavement.
   b. The permanent lighting system cannot be operational beforehand.
   c. When, as a result of grading operations, a vehicle is within 4 inches of ground clearance and 5 feet between the tires would snag on the existing foundations, or the tops of the existing foundations are more than 8 inches below the grade of the surrounding embankment.
2. At locations specified by the Engineer, including
   a. Along detours and diversions, and
   b. Along traveled ways that transition from one typical section to another, and
3. At temporary traffic signals.
4. At the locations shown in the Plans.

The Department will not require lighting from midnight June 7 to midnight July 5. Make temporary electroliers operational by sunset on the day replacing or retiring the existing system, or open a roadway and/or detour to traffic.

Submit a plan for each temporary electrolier system to the Engineer for review and approval before implementing. Allow at least two weeks for review. Provide temporary electroliers on the far right side of approaches at signalized intersections. Luminaires and mast arms may be installed on the signal poles when they do not conflict with other overhead utilities. Along roadways, choose one of the following options for temporary lighting plan:

1. When one is included, use the temporary lighting plan detailed in the Plans.
2. On roadways with existing lighting, provide new foundations and install poles and mast arms sized to keep the existing luminaires in their existing positions horizontally and vertically over the roadway. In this case, no lighting design is required.
3. Design temporary lighting system using the Contractor's choice of luminaires, including the luminaires of the permanent lighting system. Use a layout pattern, mounting height, and luminaire offset and spacing that provide a light distribution that conforms to AASHTO's "An Informational Guide for Roadway Lighting" illuminance method of design. Design the system for the roadway's functional class as specified in the Department's Annual Traffic Volume Report.

Furnish and install materials and miscellaneous hardware required to provide a functional lighting system, including foundations, branch circuitry, and electrical load centers. Size the branch conductors to provide a maximum 5% voltage drop at the most remote luminaire. Materials shall conform to the Specifications. The illumination cables may only be directly buried if the cables are listed for direct burial.

Use any of the following poles.

1. Existing light poles found within the project limits that are in suitable condition for reuse as determined by the Engineer and scheduled to be removed.
2. Poles from the permanent lighting system.
3. The following new poles may be furnished, if a minimum of 30 feet in elevation between a luminaire and the edge of traveled way is maintained.
   a. ANSI Class 4 wood poles. Installed outside the clear zone during winter shutdown. To determine the clear zone, see subsection 1130.02 of the Alaska DOT/PF Highway Preconstruction Manual.
   b. Steel, aluminum, or fiberglass poles that meet design criteria for 80 mile per hour wind speeds according to AASHTO's 1994 edition of the "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals".
   c. Poles that are part of the temporary signal systems.

Furnish temporary electrolier service between October 1 through May 15 and located within the clear zone, with an approved yielding type base. Approved yielding bases consist of FHWA approved slip bases, transformer bases, or frangible couplings. Install wood poles and other fixed base poles outside the clear zone or behind guardrail or portable concrete barrier that protects against another hazard.

Install temporary electroliers, in service at any time from May 15 through September and located within the clear zone, with approved yielding bases or with fixed bases shielded by 30 feet of barrier and an FHWA approved end treatment. Provide 2 feet of clearance between the barrier and pole. Consider the costs of furnishing the barrier and an end treatment a subsidiary obligation of Item 660(14) Temporary Electrolier. Replace fixed base poles that are located within the clear zone and which will remain in service after October 1 with yielding base poles at no expense to the State.

Use any of the following load centers to energize the temporary lighting and signal systems. Provide work needed to modify load centers to provide functional temporary lighting and signal systems according to the NEC.

1. Permanent load centers installed in their plan location.
2. Existing load centers scheduled to remain intact until completion of the project. Relocate and reuse existing load centers only if approved.
3. Approved temporary load centers with photoelectrical controlled lighting circuits. Provide a temporary load center when retiring an existing load center that is not approved, and when approved load centers are unavailable.

Approved load centers include load centers UL labeled as Service Equipment, or UL labeled as Industrial Control Equipment and marked "Suitable for use as service equipment".

660-3.13 SIGNAL SYSTEM TIMING AND ADJUSTMENTS. The Contractor shall retain the services of a representative from the controller equipment manufacturer (Manufacturer's Representative), subject to the approval by the Engineer. Submit name(s) and professional credentials at least thirty (30) days before commencing this work. All work on, and connections to, the controller unit, amplifiers, and related equipment shall be performed or directly supervised Manufacuter's Representative.

After the Municipality of Anchorage completes controller cabinet preparation, the contractor shall transport the cabinet to the project site for installation. The controller unit, the detector amplifiers, conflict monitor and related equipment shall be delivered to a location in Anchorage, Palmer, or Wasilla, arranged by the Engineer, for programming. Provide at least seven (7) days of notice prior to delivery.

The Manufacturer's representative will provide oversight and supervision of critical on-site controller wiring and connection work for the controller cabinet. This work includes:

- Loop Detector Wiring. You and the Manufacturer's Representative will test

and connect all paired loop detector conductors to the terminal blocks.

- Control Cable Wiring. You and the Manufacturer's Representative will connect all control cables within the controller cabinet to the terminal blocks.
- Interconnect Wiring (where required). You and the Manufacturer's Representative will test and connect all interconnect wiring to the terminal blocks.

Once this work is completed and approved by the Engineer, the Contractor and Manufacturer's Representative shall schedule programming, training of Department personnel, installation, field testing and the signal turn-on. After the schedule has been approved:

- The Manufacturer's Representative and the Engineer shall program the controller unit based upon timing plans provided by the Engineer, at the location arranged by the Engineer.
- The Manufacturer's Representative shall conduct a one-day training seminar on operation and maintenance of the controller, signal timing adjustments, and other signal controller-related topics requested by the Engineer. The location of the training will be arranged by the Engineer.
- The Contractor, under supervision of Manufacturer's Representative, shall install the programmed controller unit and accessories in the cabinet as required to make the signal fully operational.
- The Manufacturer's Representative shall oversee field testing. Field testing shall be coordinated with the Engineer to allow participation by Department Staff. Field testing shall be scheduled so that the turn-on day is preceded by 3 to 5 days of flashing operations once field testing is satisfactorily completed. Flashing operations shall immediately follow field testing.
- The Manufacturer's Representative shall oversee the change of the signal from flashing operations to fully actuated operations.
- The Manufacturer's Representative shall return to the project 30 days after the signal turn on to review operations with Engineer and Department staff, and to make any adjustments for improving operations. The Manufacturer's Representative shall request data to be collected by the Department that will be necessary for adjustments.

660-4.01 METHOD OF MEASUREMENT. Add the following:

Item 660(22), Illumination Price Adjustment. By the mile for each roadway with all or part of its illumination system inoperative. A divided roadway is considered one roadway. Ramps are considered a separate roadway. The Engineer will measure each unlit section less than one mile long as one mile.

Item 660(40) Temporary Electrolier. By each electrolier and foundation furnished, installed and maintained as directed by the Engineer.

660-5.01 BASIS OF PAYMENT. Add the following: Pay Item 660(1) Traffic Signal System Complete will not include payment for 660(11) Traffic Loops, 660

(25) Controller Cabinet Preparation, and 660(26) Signal System Timing and Adjustments. This work will be paid under their respective items.

The Engineer will pay Item 660(25) Controller Cabinet Preparation, based on paid receipts plus 15 percent for authorized work performed, and expenses incurred, by the Municipality of Anchorage Traffic Signal Maintenance Section. A directive will not be required to initiate payment for work performed under Item 660(25). The Contractor shall pay all costs of the Municipality for re-testing of work or equipment that fails to comply with the Plans and Specifications.

The Engineer will pay Item 660(26) Signal System Timing and Adjustments based on paid receipts plus 15 percent for authorized work performed, and expenses incurred, by the Manufacturer's Representative. All work by the Contractor under the direction of the Manufacturer's Representative is subsidiary to 660(1). A directive will not be required to initiate payment for work performed under Item 660(26). Pay all costs of the Manufacturer's Representative for work that fails to comply with the Plans and Specifications.

The amount bid for an item shall include full compensation for:

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

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

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

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

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

For each mile of roadway with existing lighting systems that you fail to keep fully operational, the Engineer will deduct $1275.00 per day from the payments due you.

The Engineer will pay for Item 660(40) Temporary Electrolier on a contingent sum basis at the unit price of $2,000/each. The Engineer does not require a change order/directive for this item.

The unit price paid for each temporary electrolier includes full compensation for work involved in getting plans and materials approved, and moving, furnishing, assembling, installing, and making each temporary electrolier operational. The price also includes full compensation for installing a foundation, removing and replacing improvements, installing conductors (in electrical conduit or by direct bury only), maintaining the

electrical system, installing temporary electrical load centers when load centers are unavailable for use, and removing the temporary electrolier and its foundation when it is no longer needed.

Pay Item 660(16) Relocate School Flasher includes related labor, equipment, and material to remove the existing school flasher and its foundation and reinstall it in the new location; including but not limited to excavation, backfill, compaction, conduit, conductors, junction boxes, control cables, and connection to existing conduits, conductors and control cables as shown on the drawings and as required to make operational. If the Contractor chooses to substitute new equipment or foundations for the existing school flasher per subsection 660-3.01, item 6, then there will be no change in payment.

Payment will be made under:

Pay Item	Pay Unit
660(14) Salvage Existing Electrolier	Each
660(16) Relocate School Flasher	Each
660(22) Illumination Price Adjustment	Contingent Sum
660(25) Controller Cabinet Preparation	Contingent Sum
660(26) Signal System Timing and Adjustments	Contingent Sum
660(40) Temporary Electrolier	Contingent Sum

(08/02/05)R66USC02

ADDENDUM NO. 2
ATTACHMENT NO. 7

SECTION 661

ELECTRICAL LOAD CENTERS

Special Provisions

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

Under Photoelectric Controls, delete the first sentence and substitute the following:
Use three wire photoelectric controls that directly switch a circuit from one conductor to another. Furnish two-piece photoelectric controls that consist of a plug-in photoelectric control unit and a locking type receptacle set in a cast aluminum adapter.

Furnish photoelectric control units that consist of a light sensitive element connected directly to a normally closed, single-pole, single-throw, control relay free of intermediate amplification. For highway lighting, use horizontal or zenith type sensing units that:

a. Operate at voltages between 120 and 277 volts AC, 60 Hz,
b. Handle loads up to 1,800 volt-amperes
c. Operate at temperatures from -40 °F to +150 °F
d. Consume less than 10 watts of power
e. Feature a 3-prong, EEI-NEMA standard, twist-lock plug
f. Turn-on between 1 and 5 footcandles and turn-off at light levels between 1.5 and 5 times those at turn-on.

Measurements must meet the procedures in EEI-NEMA *Standards for Physical and Electrical Interchangeability of Light-Sensitive Control Devices Used in the Control of Roadway Lighting*.

Furnish twist lock type, phenolic resin receptacles set in one of the following cast-aluminum adapters.

a. For photoelectric controls installed on signal poles and load centers, furnish a mounting adapter with a threaded connection that fits conduit outlet bodies threaded for ½ inch rigid metal conduit, General Electric model MB-PECTL or approved equal.

b. For photoelectric controls installed atop lighting poles (with mast arms), furnish a pole top adapter: equipped with a terminal block, made to slip over the ends of poles 3½ to 4½ inches in outside diameter, and secured by set-screws, General Electric model PTA-PECTL or approved equal.

Furnish 3-inch wide screens that reach the top of photoelectric control units to prevent artificial light from interfering with normal photoelectric control operation. Furnish screens constructed of 0.063-inch minimum thick aluminum meeting ASTM B 209, alloy 3003-H14.

Under Equipment List(s) and Drawings, replace item 1 and the last sentence in item 3 with the following:

1. Materials on the *Approved Products List*: The Approved Products List does not apply to the 661 items. Provide catalog cuts of materials to the Engineer for review and approval.
3. Materials Not Requiring Certification: Only submit these materials for review and approval if they are included on the Materials Certification List (MCL).

661-3.01 CONSTRUCTION REQUIREMENTS. Delete the 12th paragraph, and substitute the following:

Install photoelectric controls at the locations indicated. Orient photoelectric control units to face the north sky. Install a screen to prevent artificial light from interfering with normal photoelectric control operation.

For photoelectric controls installed on load centers, complete the work as follows. Install a Myers hub in a cabinet wall shielded from traffic. To the hub, attach an assembly that consists of a type LB conduit body, a length of conduit, and a type C conduit body. Fabricate the conduit at least 3 feet long and locate the photoelectric control a foot above the top of the load center. Mount the photoelectric control adapter on the type C conduit body. Install a conduit hanger to brace the top of the conduit.

For photoelectric controls installed on signal poles, install a Myers hub in the center of the rain cap. Attach a type C conduit body to the hub with a close nipple. Mount the photoelectric control adapter on the conduit body. Use five conductor 14 AWG wire to connect the photoelectric control to the load center.

For photoelectric controls installed on electroliers, install a pole top adapter. When the photoelectric control is on a lighting standard with a slip base or frangible coupling style base, use an approved breakaway disconnect in the base of the light standard. Restrain the cable in a similar manner as the illumination cable in the pole base. Use five conductor 14 AWG wire to connect the photoelectric control to the load center.

661-5.01 BASIS OF PAYMENT. Delete the first paragraph and replace with the following: Load circuits, consisting of circuit breakers, conduits and conductors attached to the load centers and photoelectric controls, and terminations of field wiring, are subsidiary to other items of work.

Add the following: Payment of any fees required by the local authority for an electrical inspection and the costs of correcting the deficiencies noted during the inspection shall be considered incidental to the Section 661 items.

Add the following Section:

SECTION 669

AUTOMATED TRAFFIC RECORDERS

Special Provisions

669-1.01 DESCRIPTION. This work shall consist of furnishing and installing three (3) automated traffic recorder stations.

An Automated Traffic Recorder (ATR) station is a vehicle detection system and may contain a traffic volume counter, an Automated Vehicle Classifier (AVC), a Weigh-In-Motion (WIM) system and/or other equipment. ATRs are operated and maintained by personnel of the Highway Data Section (HDS); main office located at 2200 E. 42nd Ave., Anchorage, phone (907) 269-0876.

A simple form of ATR consists of inductive loop sensors connected to a traffic counter. In each traffic lane, an inductive loop is buried beneath the pavement. Lead wires run from the sensors to a type CBA1 cabinet located at the side of the road. At the type CBA1 cabinet, the lead wires connect to the traffic counter. A portable, battery-operated traffic counter that detects passage of vehicles and stores the data for later retrieval collects traffic volume information.

A typical AVC consists of inductive loop and piezoelectric sensors connected to a traffic counter. In each traffic lane, two inductive loops are separated by a specific travel distance and buried beneath the pavement. A single piezoelectric sensor is located between them, embedded in the pavement surface. Lead wires run in underground conduit from the sensors to a type CBA2 cabinet located at the side of the road. Inside the type CBA2 cabinet, the lead wires connect to the traffic counter. The traffic counter detects the presence and speed of passing vehicles from inductive loop signals. The traffic counter detects axle number and center-to-center axle spacing from piezoelectric signals. Presence, speed and axle passage information is processed by the traffic counter to classify the number and type of vehicles, which is stored for later retrieval.

ATR stations may be equipped with a Temperature Data Recorder (TDR), which consists of temperature sensors connected to a datalogger. Sampled conditions may include air temperature, pavement profile temperatures and subgrade profile temperatures. Temperature sensors send voltage signals to the datalogger. Sensor voltage levels are processed by the datalogger to yield temperature information that is stored for later retrieval.

The locations of traffic detection sensors and cabinets, shown on the plans are approximate and the Engineer shall establish the exact locations in the field.

669-1.02 REGULATIONS AND CODE. Materials and workmanship shall conform to the standards of the Underwriter's Laboratories, Inc. and the National Electrical Safety Code and local safety code requirements, where applicable.

Electrical equipment shall conform to the standards of the National Electrical Manufacturer's Association, where applicable.

669-2.01 MATERIALS. Materials provided shall be new, unless otherwise stated, and shall meet the following requirements:

1. Wiring. Wiring shall be according to subsection 660-3.05, Wiring. Single wire conductors and cables shall have clear, distinctive and permanent markings on the outer surface throughout the entire length giving the manufacturer's name or trademark, the insulation type-letter designation, the conductor size, voltage rating and the number of conductors if a cable. Wires and cables must be home run labeled in each junction box and cabinet; for example, W1SLA (for wire) and GaSLA (for cable) as shown on the plans.

2. Conduit. Conduit shall be according to subsection 660-3.03, Conduit. Conduit, except for PVC conduit forming the inductive loops, shall be galvanized rigid metal. Grounding bushings shall be plastic-sleeved to minimize the potential for insulation damage during wire pulls.

3. Junction Boxes. Junction boxes shall be according to subsection 660-3.04, Junction Boxes. The covers of junction boxes used for loops or sensor wires shall be labeled 'TRAFFIC'. The covers of all junction boxes used to provide electrical service to ATR installations shall be labeled 'ELECTRIC'. Junction boxes for 120V/240V electrical service shall be kept completely separate from junction boxes containing loop or sensor wiring

4. Terminal Blocks. Terminal blocks shall have nickel, silver or cadmium plated brass binder-head screw terminals. Terminal blocks shall be a barrier type, rated 600 VAC at 20 Amps, sized for 12-18 AWG wire with removable shorting bars in each position and with integral type marking strips.

5. Presence Loops. Presence loops shall be according to subsection 740-2.05, Conductors. Conductors used for detector presence loops shall be UL listed as IMSA specification #51-5-1984 single conductor PVC nylon with tube jacket, type THHN, #14 AWG.

   Multiple pair loop lead-in cable shall consist of twisted pairs of 18AWG stranded tinned copper wire. Each twisted pair shall have its own 20AWG tinned copper drain wire. An aluminum foil shield shall surround each individual bundle of twisted pair and drain wire. Multiple pair loop lead-in cable shall have an overall PVC or PE outer jacket.

6. Electrical Load Centers. Electrical Load Centers shall be NEMA Type 3R and provide a 120/240V 2.5KVA single-phase, three-wire-circuit electrical service.

7. Style CBA1 Cabinets. Cabinets shall meet or exceed a NEMA Type 3R rating. Style CBA1 cabinets shall meet the following requirements:

Cabinet Construction. The cabinet and hinged door shall be constructed from sheet aluminum alloy, and shall be unpainted with a smooth exterior finish. Welds shall be neatly formed and free of irregularities. Inside and outside edges of the cabinet shall be free of burrs. Provide cabinet with aluminum mounting plate as shown on the plans.

8. Style CBA2 Cabinets. Cabinets shall meet or exceed a NEMA Type 3R rating. Cabinets shall be third party certified as an assembly. Style CBA2 cabinets shall meet the following requirements:

a. Cabinet Dimensions. Unless otherwise shown on the plans, the cabinet shall be 48-in high, 27-in wide, and 16-in deep.

b. Cabinet Construction. The cabinet and door shall be constructed from 5052-H32 or better sheet aluminum alloy with a minimum thickness of 1/8-in. The cabinet shall be unpainted, with a smooth grain finish on the exterior. Welds shall be neatly formed and free of cracks, blow holes and other irregularities. Inside and outside edges of the cabinet shall be free of burrs. The cabinet shall be designed with a sloped top to prevent the accumulation of water on its top surface.

c. Door. The door opening shall be double flanged on all four sides to prevent dirt and liquids from entering the enclosure when the door is opened. A door restraint shall be provided to prevent door movement in windy conditions. The cabinet door shall be a minimum of 80 percent of the front surface area and shall be hinged on the right side when facing the cabinet. The door shall be furnished with a gasket that satisfies the physical properties found in UL508 table 21.1 and shall form a weather tight seal between the cabinet and the door. The hinge shall be continuous and made either of stainless steel or of minimum of 1/10-inch thick aluminum. The hinge shall either be securely welded along a quarter or more of its length, or bolted to the cabinet utilizing stainless steel bolts and non-slip nuts.

d. Latch/Lock. The latching mechanism shall be a 3-point draw roller type. The center catch and pushrods shall be either stainless steel or cadmium plated, Type II Class 1, equal or better. Rollers shall have a minimum diameter of 3/4-inch and will be made of nylon. A stainless steel operating handle shall be furnished with a 3/4-inch shank. The lock shall be a Corbin #2 lock keyed to match existing

Highway Data Section (HDS) cabinets. Two keys shall be furnished with each lock.

e. Ventilation. Ventilation shall be provided with louvered vents in the front door with a removable air filter. Louvers shall satisfy the NEMA rod entry test for 3R ventilated cabinets. The filter shall cover the vents and shall be held firmly in place with bottom and top brackets and a spring-loaded top clamp. Exhaust air shall be vented out between the top of the cabinet and the door.

f. Shelves. Adjustable equipment shelves shall be mounted on "C" mounting channels inside of cabinet and be supported on both sides. There shall be 2 vertical channels mounted on both sides of the cabinet and on the back, for a total of 6 inside each CBA2 cabinet. Shelves shall be constructed from 5052-H32 or better sheet aluminum alloy with a minimum thickness of 1/8 inches. The shelf depth shall be a minimum of 10.5 inches. Shelves shall be adjustable to within 4 inches of the bottom and to within 8 inches of the top of the cabinet.

g. Keyboard Tray. A retractable tray shall be mounted as shown in the plans.

h. Terminal Blocks. Terminal Blocks shall be mounted horizontally as shown in the plans.

Style CBA2 cabinets which include electrical service shall also meet the following requirements:

i. Circuit Breaker Panel. The circuit breaker panel shall conform to the UL67 and NEMA PB1 standards. The circuit breaker panel shall be an MLO, Two-Pole, 3 wire configuration, rated 40 Amp (minimum) 120/240 Volts, in a NEMA Type 2 enclosure with separate neutral and ground buses. Circuit breakers shall consist of two 20 amp single-pole types with a minimum short-circuit interrupting rating of 10,000 AIC. Circuit breaker #1 will serve the utility and equipment receptacles, and circuit breaker #2 will serve the thermostatically controlled outlet, cooling fan, and cabinet light.

j. Transient Voltage Surge Protection. Transient voltage surge protection, rated minimum 500 Volts at 3000 Amps, shall be integral to the circuit breaker panel, or integral to each individual circuit breaker.

k. Interior Light. The interior light fixture shall be a fluorescent, 120 volt single-tube lamp rated 13 watts minimum with a ballast that will start the lamp at temperatures of 0°F. A single pole, illuminated toggle switch, mounted inside of the cabinet door, will control the light.

l. Cooling Fan. A thermostatically controlled fan in the top of the cabinet shall operate at a settable high temperature limit and exhaust air through a filtered and hooded vent at the top front of the cabinet. Any integral thermostat will be set at a temperature lower than the thermostat noted in item 0 below so that the auxiliary thermostat controls the fan, and not any integral thermostat.

m. Thermostatically Controlled Outlet. A thermostatically controlled single duplex outlet shall operate at a settable low temperature limit.

n. Thermostats. Thermostats for the thermostatically controlled outlet and cooling fan shall be remote bulb types with SPDT contacts rated for 16 amps @ 120 VAC for combined motor and resistive loads. Thermostats shall be Tradeline T6031A1029 (equal or better), White-Rogers, Johnson Controls, or Sunne brands. Thermostats for the "Thermostatically Controlled Outlet" shall have a contact that closes on lowering temperature and set at 35°F. The thermostat for the "Cooling Fan" shall have a contact that closes on rising temperature and set at 90°F. Mount sensing bulbs as shown on the Plans.

o. Conduit, Raceway and Layup. Wiring for 120V equipment including circuit breaker panelboard, light, vent fan, and power receptacles shall be in EMT, liquid tight metal flex conduit or metal clad. Other low voltage wiring shall be terminated on terminal blocks and neatly trained within cabinet using wiring duct or ties.

p. Certification. The Cabinet Assembly consists of the cabinet itself and high voltage (greater than 24 volts) components that are permanently installed, including the circuit breaker panel, receptacles, light and fan as shown on the drawings or described herein. The Contractor shall obtain certification that the cabinet and associated permanently installed equipment, as a unit, complies with recognized applicable national standards through an authorized local or national testing agency or fabrication shop that complies with ANSI Z34.1-1987 "Third-Party Certification Programs for Products, Processes, and Services", including but not limited to; Electrical Testing Laboratories (ETL), Underwriters Laboratories (UL), Canadian Standards Association (CSA), Electro Test Incorporated (ETI), or other certified testing agency recognized by the Labor Standards & Safety Division of the State of Alaska Department of Labor.

9. Pavement. Pavement materials shall meet the following requirements:

   a. Asphalt Pavement. Materials used for asphalt pavement shall conform to Section 401, Asphalt Concrete Pavement, Type II and shall be approved by the Engineer.

   b. Concrete Pavement. Materials used for concrete pavement shall conform to Section 501, Structural Concrete, and the amendments contained herein.

10. Environmental Sensors. The Contractor shall provide environmental sensors.

   a. Road Temperature Thermocouple. The Datalogger Road Temperature Thermocouples shall be equal to or better than a Campbell Scientific Model 105-L100 Road Temperature Thermocouple.

   b. Air Temperature Thermocouple. The Datalogger Air Temperature Thermocouple shall be equal to or better than a Campbell Scientific Model 107-L50 Air Temperature Thermocouple.

   c. Radiation Shield. The Datalogger Air Temperature Thermocouple Radiation Shield shall be equal to or better than a Campbell Scientific Model No. 41301 6-Plate Gill Radiation Shield.

   Environmental Sensors are available from:

   Campbell Scientific, Inc.
   815 W. 1800 N
   Logan, Utah 84321-1784

   http://www.campbellsci.com

   voice: (801) 753-2342
   fax: (801) 752-3268

11. Vertical Temperature Probes. The vertical temperature probes shall be equal to or better than an MRC Model TP101 temperature probe. The temperature probes shall meet the following requirements:

   a. Thermistors. Total of 16 thermistors. Each thermistor shall be accurate to ± 0.2 °F.

   b. Top Thermistor. Thermistor number one shall function at the end of a 1-ft lead connected to the top of the temperature probe.

c. Thermistor Placement. Thermistors shall be placed along the length of the probe at 3 inch spacing for first 12 inches. Thermistors shall be placed along the length of the probe at 6 inch spacing from 12 inches to 72 inches.

d. Connection Cable. The interface cable shall project radially from the top of the temperature probe. The interface cable shall have sufficient length (minimum of 100') to reach the cabinet without splices (does not require 4-prong plug)

Vertical Temperature Probes are available from:

Measurement Research Corporation
4126 4th Street NW
Gig Harbor, WA 98335

voice: (206) 851-3200

669-3.01 CONSTRUCTION REQUIREMENTS.

1. Wiring.

a. Referenced Requirements. Wiring shall be installed according to subsection 660-3.05, Wiring.

b. Termination. At junction boxes, unused pairs shall be terminated within splices. At cabinets, unused pairs shall be terminated to a terminal block. At terminal blocks, conductors, including unused spares, shall terminate and be soldered to "spade" type terminal lugs.

c. Relief. Wiring shall have at least 2-ft of slack cable in each junction box and at least 6-ft of slack cable available in the equipment cabinet before the terminal block.

d. Labeling. Wiring shall be labeled in junction boxes and at terminal blocks.

2. Conduit.

a. Referenced Requirements. Conduit shall be installed according to subsection 660-3.03, Conduit, or as indicated on the plans.

b. Pull Cords. Nylon pull cords shall be left in conduits larger than 1 inch and in spare conduits.

c. Bushings. Plastic or plastic-sleeved bushings shall be in place before wire pulls are performed.

3. Junction Boxes.

   a. Referenced Requirements. Junction boxes shall be installed according to subsection 660-3.04, Junction Boxes, or as indicated on the Plans.

   b. Voltage Limitation. Junction boxes used for ATR installations shall not contain any wiring of systems at or greater than 24 V or conduits carrying wiring of systems at or greater than 24 V.

4. Terminal Blocks.

   a. Terminal Block Placement. Terminal blocks within cabinets shall be mounted so that terminals are easily accessible from the front of the cabinet.

   b. Labeling. Terminal blocks and wire pairs shall be clearly labeled on the block.

   c. Termination. Conductors, including unused spares, shall terminate and be soldered to "spade" type terminal lugs.

5. Presence Loops.

   a. Referenced Requirements. Presence loops shall be installed and constructed according to subsection 660-3.05, Wiring, unless otherwise specified on the Plans.

   b. Placement Design Adherence. The plans are not schematics; installation of the presence loops shall closely conform to the location and layout of conduit runs shown in the Plans.

   c. Presence Loop Dimensions. Unless otherwise noted, presence loops shall be formed of four turns of wire, and shall be 6 ft square with plus-or-minus 1 inch (± 1 inch) tolerance.

   d. Presence Loop Dimensions for On-Ramps and Off-Ramps. Presence loops in On-Ramps and Off-Ramps shall be formed of four turns of wire, and shall be rectangular 8 ft. wide and 6 ft. long with plus or minus 1 inch (± 1 inch) tolerance.

   e. Lead-in Conduit. Lead-in conduit from edge of pavement to the presence loops shall be straight and perpendicular to the centerline of the road.

   f. Presence Loop Alignment. Presence detector loops shall be centered in the traffic lane plus or minus 1 inch (± 1 inch) tolerance.

g. Presence Loops in Asphalt.

1) Presence Loop Interval. Unless otherwise noted on the plans, presence loops in a lane shall be located 16-ft from leading edge to leading edge with plus or minus 1 inch (± 1 inch) tolerance. Presence loops located in adjacent lanes shall be aligned within plus or minus 1 inch (± 1 inch) tolerance.

2) Presence Loops In Existing Asphalt. Presence loops installed through existing asphalt pavement shall be installed using full lane width cuts a minimum of 8 ft. length. Inductive loops shall be centered in the 8 ft. cut and spaced a minimum distance of 1 ft. from the edge of the cut. Edges of the cuts shall be heated and tack coated during patching to ensure full adhesion. Full-width patches shall be rolled sufficiently to ensure compaction equal or better than the existing asphalt, and to prevent edge ridges or settling of the patch from 'telegraphing' through the final lift asphalt.

Compaction tests shall be required at the discretion of the Project Engineer.

3) Presence Loops In New Asphalt. Loops installed in new asphalt paving shall be installed immediately before final paving of the particular section of road. Installation of loops after final lift paving shall not be permitted.

h. Presence Loops in Concrete.

1) Presence Loop Placement. Unless otherwise noted on the plans, presence loops in a lane shall be located 24-ft from leading edge to leading edge with plus or minus 1 inch (± 1 inch) tolerance. Presence loops located in adjacent lanes shall be aligned plus or minus 1 inch (± 1 inch) tolerance.

2) Presence Loop-Install Concrete Saw Cutting. Saw cutting for inductive detector loops shall not be performed until after the Project Engineer confirms that the PCC pavement has been ground, straight edged and brought into tolerances as provided in these Special Provisions and subsection 501-3.09.3, Finishing Concrete Surfaces: Concrete Decks.

A diagonal cut shall be placed 6 inch inside each square corner of presence loop slots cut into the PCC pavement. These diagonal cuts allow avoidance of sharp corners and bends that may damage the presence loop wire.

The Contractor will not begin sawcutting until the Engineer approves the sawcutting method.

Slot cuts in the pavement shall be washed clean, blown out and thoroughly dried before installing presence loop wire. After the loop wire is placed, the sawcut shall be filled with 3M epoxy loop sealant or an approved equal.

6. Piezoelectric Sensors.

a. Manufacturer's Recommendations: Piezoelectric sensors shall be installed according to AVC equipment and piezoelectric sensor manufacturer's recommendations. Piezoelectric sensor installations will be observed and approved by the piezoelectric sensor manufacturer's representative, or a piezoelectric sensor manufacturer-certified installation technician.

b. Placement Design Adherence. The plans are not schematics; installation of the piezoelectric sensors shall closely conform to the location and layout of conduit runs shown in the plans.

c. Sawcut Requirement. Piezoelectric sensors shall be installed in sawcut slots in final pavement. "Blockouts" shall not be used.

d. Coaxial Cable. Coaxial cables shall be run to the equipment cabinet without splices and terminated on the specified terminal block, with at least 6 ft. of slack cable available in the equipment cabinet before the terminal block.

e. Lead-in Conduit. Lead-in conduit from edge of pavement to the piezoelectric sensors shall be straight and perpendicular to the centerline of the road. Lead-in conduits for piezoelectric sensors shall be installed and capped at the sensor end with tape or sealant before paving. Lead in conduits shall extend beyond the edge of the pavement. Lead in conduit runs to junction boxes and cabinets may be completed before or after paving.

f. Piezoelectric Sensor Alignment. Unless otherwise noted, Piezoelectric Sensors shall be centered in the traffic lane plus or minus 1 inch (± 1 inch) tolerance.

g. Piezoelectric Sensor Alignment for Shouldered Lanes. Piezoelectric Sensors in Shouldered Lanes shall be offset from centerline toward the outside shoulder. Piezoelectric Sensors in Shouldered Lanes shall extend 1 foot beyond the fog line plus or minus 1 inch (± 1 inch) tolerance.

h. Piezoelectric Sensor Interval. Unless otherwise noted, each piezoelectric sensor shall be centered in the travel interval between that sensor's adjoining inductive loops. Piezoelectric sensor placement shall be within plus or minus 1 inch (± 1 inch) tolerance.

i. Piezoelectric Sensor Replacement In Existing Pavement. Any piezoelectric sensors and epoxy to be replaced shall be completely removed by sawcutting. Sawcuts for piezoelectric sensor removal shall be straight and square. Sawcut slots resulting from piezoelectric sensor removal shall be filled with the same type epoxy as used to install piezoelectric sensors. Epoxy patched sawcut slots shall be formed by grinding to match the pavement surface profile.

Replacement piezoelectric sensors shall be centered 1 ft. from the original location of removed sensors, offset in the direction opposite of lane traffic flow.

j. Piezoelectric Sensors in New Asphalt. Piezoelectric sensors installed in new asphalt pavement shall be installed only after final paving and three day's normal traffic use of the particular section of road.

k. Piezoelectric Sensor Install Concrete Saw Cutting. Saw cutting for piezoelectric sensors shall not be performed until after the Project Engineer confirms that the PCC pavement has been ground, straight-edged and brought into tolerances as provided in these Special Provisions and subsection 501-3.09.3, Finishing Concrete Surfaces: Concrete Decks. The Engineer shall approve the sawcutting method before beginning cutting. Saw cuts in the pavement shall be washed clean, blown out and thoroughly dried before installing piezoelectric sensors.

7. Cabinets.

a. Cabinet Placement and Orientation. Cabinets shall be installed out of the clear zone and with the doors facing away from the road.

b. Conduit Entry. Conduits entries for any above-ground enclosure shall be made through the bottom of the enclosure. No conduit runs shall be cut through the sides or top of any above-ground enclosure.

c. Style CBA1 Cabinets.

1) Mounting. The Style CBA1 cabinets shall be mounted on a 2.5 inch perforated steel tube and supported with a sleeved concrete foundation as shown on the plans.

2) Terminal Blocks. Terminal blocks in CBA1 cabinets shall be mounted vertically as shown on the plans.

d. Style CBA2 Cabinets.

Mounting. The Style CBA2 cabinets shall be mounted on 4 inch GRMC or DN100 galvanized pipe and supported with a reinforced concrete foundation as shown on the plans.

8. Utilities.

a. Electrical. The Contractor shall provide and install the Load Center according to the plans, specifications and the requirements of the appropriate Electrical Utility. Wiring from the Load Center to the equipment in the cabinet shall be provided and installed by the Contractor. The Contractor shall request inspection of the Load Center by the Department of Labor, Division of Mechanical Inspection (DOL/DMI). After approval of the Load Center by the DOL/DMI, the Contractor shall inform the Resident Engineer as to when electrical service is needed at the Load Center, with sufficient time to schedule the installation with the Electrical Utility before commissioning of the equipment. The Electrical Utility will provide service to the Load Center upon request of the Engineer.

b. PSTN (public switched telephone network). The Telephone Utility will provide and install a Network Interface Device (NID) in or near the Cabinet. Underground wiring for telephone service shall be provided and installed by the Telephone Utility. The Contractor shall provide and install a type RJ-11 telephone jack inside the Cabinet, and shall install all wiring to connect the telephone jack with the NID. The Contractor shall inform the Engineer as to when telephone service is needed at the telephone jack, with sufficient time to schedule the installation with the Telephone Utility before commissioning of the equipment. The Engineer will make arrangements in writing with the Telephone Utility to install and connect the NID. The Engineer will inform the Contractor of the telephone number at the NID.

9. Asphalt Pavement Smoothness: There shall be no transverse seams, joints or roughness within 50 ft. of any inductive loops placed in asphalt pavement section. The finished surface of the asphalt shall be tested with a straightedge 10 ft. long. The surface shall not vary more than ¼ inch from the lower edge of the straightedge within 50 ft. of sensors at the ATR installations. At the discretion of the Engineer, a profilograph equipped with a chart recorder shall be run along each wheelpath of each lane. The profilograph will be supplied by the Highway Data Section and shall be operated by Contractor personnel. Each profilogram shall extend 50 ft. beyond either end of the ATR installation. The asphalt surface as recorded by the chart recorder shall not vary more than ¼ inch within 10 ft. of distance.

10. Concrete Pavement Smoothness: The Portland Cement Concrete pavement smoothness shall be done according to subsection 501-3.09.3, Finishing Concrete Surfaces: Concrete Decks.

11. Field Inspection. Before installation of conduit, wiring, inductive loops, bending plate equipment, piezoelectric sensors, temperature sensors or cabinets, the Contractor shall notify the Engineer. Notification shall be given in writing, through the Project Engineer, a minimum of 3 working days before installation (excluding Saturday, Sunday and State or Federal Holidays). The Engineer shall be present to approve the installation before final burial or encasement. Any unacceptable installations shall be corrected and re-inspected for completeness before burial or encasement. Any burial or encasement without approval by the Engineer shall be uncovered, removed, and/or replaced at the Contractor's expense. Any expense or delay in the project scheduling will be the responsibility of the Contractor.

669-3.02 ACCEPTANCE TESTING. The Contractor shall perform acceptance testing on all ATR installations.

1. General Tests. The Contractor shall perform tests for the ATR installations according to subsection 660-3.01.7, Field Tests.

2. AVC Acceptance Tests.

   a. Scope and Governance. In addition to the General Tests, the Contractor shall perform Acceptance Tests on all AVC installations. AVC Acceptance tests govern acceptance or rejection of the AVC installation.

   b. Manufacturer Participation. Acceptance tests shall be observed and assisted by the AVC counter manufacturer's representative, or an AVC counter manufacturer-certified installation technician.

c. Engineer Participation. The Engineer shall be on-site during final acceptance testing. The Contractor shall provide documentation of the test vehicle's gross weight and measured axle spacing to the Engineer before testing. The Engineer must approve the test vehicle before testing. The Engineer must approve the scheduling of data sampling and testing for each lane before testing.

d. Results Certification. The Engineer shall certify in writing when the installation has met the accuracy requirements of the acceptance tests.

e. Acceptance Test Procedure. The contractor will perform the Acceptance Tests as follows:

The Contractor shall acquire a set of test data for the AVC sensor array. Test data shall be obtained by passing a test vehicle over the AVC sensors in each lane. Test data shall consist of 10 valid samples per lane for the test vehicle. Test data samples will include FHWA class designation and computed axle spacing for each sensor pass.

To be considered valid, sample data must be obtained under the following conditions:

1) The test vehicle must maintain good lane discipline while traversing the entire sensor array.
2) The test vehicle must maintain a constant speed, between 40mph and the maximum speed limit, while traversing the entire sensor array.
3) Data for a particular lane must be acquired using the same vehicle.
4) Sample data must be from successive sensor passes of the test vehicle. Data may not be omitted or included out of order for any 10 samples.

f. Accuracy Requirements. The Automated Vehicle Classifier must meet the following requirements separately in each lane:

1) The AVC system correctly assigns FHWA class designation for 9 out of 10 successive sensor passes of the test vehicle.
2) The AVC system computes axle spacings to within 6-inches of the actual measurements, for 9 out of 10 successive sensor passes of the test vehicle.

g. Test Vehicle. The Contractor shall provide, and arrange for, the test vehicle and drivers as needed for the acceptance testing.

The test vehicle shall be a five axle, eighteen wheel, single trailer vehicle (FHWA Class 9), with high-cube-rated (HCR) trailer.

h. Class 9 Vehicle. The Class 9 vehicle shall meet the following requirements:

1) spacing between the steering axle and the drive axle group of 11.3 to 24.6 ft
2) spacing between the drive axles of 3.5 to 6.0 ft
3) spacing between the drive axle group and the trailer axle group of 6.1 to 46.0 ft
4) spacing between the trailer axles of 1.1 to 40.0 ft

i. Vehicle Loading. The Contractor shall ensure that the test vehicle is loaded with non-shifting material to a minimum of 50 percent of legal load during testing.

j. Tire Inflation. The Contractor shall ensure that all tires on the test vehicle are inflated to recommended pressures during testing.

j. Weighing Method. The gross weight of the test vehicle and the weight of the test vehicle's axle groups shall be determined by weighing on a static scale at a scale house operated by the State of Alaska Department of Commerce, Division of Weights and Measures.

An axle group is defined as any two axles whose centers are within 8 ft. of each other.

A Class 9 single trailer test vehicle has three axle groups.

669-3.05 DELIVERABLES. Deliverables shall be submitted to the Engineer before final approval of the work or as otherwise called for herein.

1. Materials Submittal

a. Format and Contents. The Contractor shall provide a Materials Submittal of proposed equipment and materials for the ATR installations. The Materials Submittal shall consist of three collated copies of an equipment and materials portfolio. Each identical portfolio shall contain information of sufficient detail to determine the suitability of the equipment and materials proposed.

b. Table of Contents. Each portfolio shall include a table of contents listing each item's intended uses, item description, product name, manufacturer, model or part number and reference to associated information within the portfolio.

c. Reference Drawings. The Materials Submittal shall include a detailed shop drawing of each equipment cabinet showing the location of all mounted components.

d. Delivery Interval. The Materials Submittal shall be delivered for review and approval of the Engineer within thirty days following award of the contract.

e. Liability. The State of Alaska will not be liable for any materials purchased, labor performed, equipment used or delay to the work before all equipment and materials have been reviewed and approved.

2. Utility Schedule.

a. The Contractor shall provide a Utility Schedule identifying actions required to ensure activation of electrical and telephone service before installation and commissioning of ATR equipment at affected sites. The Utility Schedule shall consist of three collated copies of the lists of action items.

b. A separate list of chronologically and sequentially organized actions will be created for each affected ATR station.

c. On the lists, each action item shall include:

1) a description of the action
2) when the action will occur
3) the name, employer, position title and telephone number of the point of contact for initiating the action
4) the name, employer, position title and telephone number of the party responsible for completing the action.

d. The Utility Schedule shall be delivered for review and approval of the Engineer within thirty days following award of the contract.

3. As Built Plans.

a. The Contractor shall prepare four complete sets of as-built plans that will be current with the construction. These as-built plans shall detail all construction changes made to the ATR design and include the following information on the appropriate sheets:

1) location and depth of all inductive loops, piezo sensors, conduit runs and scales.
2) locations of all equipment cabinets and junction boxes.
3) station and offset of all junction boxes

b. Three sets of as-built plans shall be presented to the Engineer, and one set shall be affixed to the inside of the cabinet door at the appropriate Automated Traffic Recorder Installation in a waterproof, clear plastic holder.

c. Redlines of full size construction plans will be acceptable as builts.

4. Photographs.

a. The Contractor shall provide photographic prints, 35 mm negatives and Kodak Picture CD format CDROMs documenting sensor installations.

b. Photographs, negatives and CDROMs shall be delivered organized in one or more white colored, D ring style, 3 ring binders with clear insert overlays on fronts and spines. Photographs and negatives will be mounted in archival quality polypropelene pocketed sheets. CDROMs will be placed in CD storage sheets inside the binders.

c. The photographs shall be 5 inch x 7 inch color prints.

d. Each photograph shall be labeled with the identification of its subject. ATR station and device designation as indicated on the plans will be used as identification whenever possible (example: H1-W1NLA). Labels will be photographed with the subject and will be rendered large enough to be read with the unaided eye.

e. The photographs shall show the inductive loops and conduit in place before covering with gravel and pavement for asphalt pavement sites, or before covering with epoxy compound for concrete pavement sites. The photographs shall include:

1) two or more overall views of each ATR installation showing placement of the inductive loops.
2) one or more views of each loop showing the loop and the conduit to the nearest junction box
3) one or more views of each piezo sensor conduit showing the coaxial cable, sawcut, and conduit to the nearest junction box
4) one or more views of each temperature sensor showing the lead cables, sawcut, and conduit to the nearest junction box

5. Test Results.

a. Written or printed copies of the final results of all tests, signed by the Contractor, shall be provided to the Engineer prior to acceptance of the Automated Traffic Recorder Installation. Tests will be conducted in accordance with subsection 660-3.01.7, Field Tests.

b. AVC Test Results.

An AVC Test Report shall be provided to the Engineer before acceptance of the Automated Traffic Recorder Installation.

The AVC Test Report shall include both an electronic copy and a paper copy of the AVC counter's per-vehicle-record log of the AVC tests.

The AVC Test Report shall include an electronic copy and a paper copy of the final AVC calibration test data. Included AVC calibration test data shall be sorted by test vehicle, tabulated in a spreadsheet and certified by the AVC manufacturer's representative.

6. Manuals. The Contractor shall provide to the Engineer all installation, repair and operation manuals for all Automated Traffic Recording equipment, telemetry equipment, dataloggers, and environmental sensors.

7. Materials.

a. The Contractor shall provide to the Engineer any ATR equipment, sensors, and all epoxy grout remaining after installation.

b. The Contractor shall palletize the Deliverable Materials.

c. The Contractor shall group the contents of each pallet by like items.

d. The Contractor shall attach to each pallet a sealed plastic pouch containing complete copies of Material Safety Data Sheets that apply to the contents of that pallet.

e. The Contractor shall provide an itemized list of Deliverable Materials. For each item, the list shall detail:

1) Item description: including nature of the item, brand name, manufacturer name, model number, type number and serial number.
2) Item condition
3) Item quantity

f. The Contractor shall provide complete copies of Material Safety Data Sheets that apply to the Deliverable Materials. The Contractor shall attach these Material Safety Data Sheets after the last page of the Deliverable Materials list.

669-4.01 METHOD OF MEASUREMENT. The quantity to be paid for will be the actual number of completed and accepted Automated Traffic Recorder Installations as shown on the plans or as directed by the Engineer.

669-5.01 BASIS OF PAYMENT. The contract unit bid price for all Automated Traffic Recorder installations shall be full compensation for furnishing equipment, labor and materials necessary to complete the work as specified, with the following exceptions:

1. Backfill materials required will be paid for under their respective pay items.

2. Asphalt required will be paid for under a separate pay item.

*****delete*****

5. Excavation, load centers, as-built plans, the manufacturer's representative and acceptance testing required for these installations will not be paid for separately, but will be subsidiary to the Automated Traffic Recorder Installations.

6. Type II and Type IA J-Boxes, 1 inch rigid conduit, and 2 inch rigid conduit, **and loop detectors** associated with the Automated Traffic Recorders are subsidiary to the 669 items. Traffic Control required to install Automated Traffic Recorders is paid for under 643 items.

20% of the Billing for item 669(1) will be withheld until the

1) deliverables have been provided to the Engineer, as required, ensure full compliance under this section

2) and the Highway Data Section has approved the deliverables in writing.

This is done to ensure full compliance under this Section.

Payment will be made under:

Pay Item	**Pay Unit**
669(1) Automated Traffic Recorders	Each

SECTION 670

TRAFFIC MARKINGS

Special Provisions

670-1.01 DESCRIPTION. Delete this subsection in its entirety and substitute the following: This work consist of furnishing, preparing and placing pavement markings at the locations shown on the Plans or as directed. Meet these Specifications and the applicable portions of the Alaska Traffic Manual.

670-3.01 CONSTRUCTION REQUIREMENTS. Delete all paragraphs under item 4. Methyl Methacrylate Pavement Markings. and substitute the following:

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

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

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

c. Manufacturer Certified Installers. Install methyl methacrylate pavement markings using only striping installers certified by the marking materials manufacturer for the specific striping material and method. Submit these certifications to the Engineer at the Preconstruction Conference.

d. Preparation. Prepare the roadway surface to receive methyl methacrylate according to these Specifications and the manufacturer's recommendations. Clean and dry the roadway surface. Completely remove contaminants such as dirt, loose asphalt, curing agents, surface oils, or existing road marking materials before applying pavement marking material.

e. Application. Apply methyl methacrylate marking material according to these Specifications and the manufacturer's recommendations. Use equipment designed and capable of properly mixing at the point and time of application and approved by the manufacturer for the type of product being installed.

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

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

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

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

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

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

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

f. Disposal of Waste. Waste material becomes the Contractor's property. This includes grindings and removed marking material. Do not dispose of or store stripe removal wastes material or asphalt grindings on State property. Dispose of waste material according to applicable Federal, State, and local regulations.

g. Sampling. On the form provided by the Engineer, record the following

readings, and the locations where they were taken, and submit them to the Engineer within 24 hours for evaluation. Thickness of material and depth of slot are measured from the surface of the pavement.

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

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

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

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

(5) Measure the retroreflecivity of each transverse marking at three locations, and of each line at intervals not to exceed 1,500 feet. Take these measurements using a Delta LTL2000 Retrometer, a 100 foot retro-reflectometer, or approved similar device. Perform testing within 72 hours of curing.

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

670-3.04 PAVEMENT MARKING REMOVAL. Add the following: Coordinate removal work with construction activity. Remove pavement markings the same day permanent markings are applied, unless otherwise directed. Use vacuum shrouded equipment or other equally effective containment procedures.

Add the following subsection:

670-3.07 TOLERANCES FOR METHYL METHACRYLATE PAVEMENT MARKINGS.

1. Length of Stripe. ± 2 inches.
2. Width of Stripe. ± 1/8 inch.
3. Lane Width. ± 4 inches from the width shown in the Plans.
4. Stripes on Tangent. Do not vary more than 1 inch laterally within a distance of 100 feet when using the edge of the stripe as a reference.
5. Stripes on Curves. Uniform in alignment with no apparent deviations from the true curvature.
6. All Stripes. Keep the center of the stripe within 4 inches from the planed alignment.
7. Double Stripes. ± ¼ inches
8. Thickness of surface applied. Minimum specified to a maximum of + 30 mils.

9. Depth of Inlay Slot. Minimum 250 mils to a maximum of 290 mils.
10. Thickness of Inlaid Marking Material. Fill inlay area completely from the bottom of the inlay to the surface of the pavement.

If it is determined that the material is being placed too thin, or otherwise not to specification, make immediate adjustments to correct the problem.

Methyl methacrylate pavement markings applied by any method will be unacceptable if:

1. The marking is not straight or wide enough.
2. The thickness of the line is not uniform or less than specified.
3. The top of the line is not smooth and uniform.
4. The material is uncured.
5. The material blackens or is inconsistent in color.
6. The inlay slot is not ground to the specified depth.
7. The inlay slot is not filled to the specified depth.
8. The edge of the markings are not clear cut and free from overspray.
9. The reflective elements are not properly embedded.
10. The markings exhibit poor adhesion.
11. The retro-reflectivity of the markings is less than specified.
12. The color is not as specified.

Perform repairs using equipment similar to the equipment initially used to place the materials. Do not perform repairs in a "patch-work" manner. If more than one repair is required in a single 300 foot section, grind and repair the entire section.

670-4.01 METHOD OF MEASUREMENT. Add the following: Thickness will be measured from the top of the marking to the top of the pavement surface. Marking material placed in a depression left by pavement line removal will not be included in measuring the thickness of the line.

Delete Items 2 and 3 and replace with the following:

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

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

4. Foot Basis: Longitudinal Pavement Markings, surface applied or inlaid, will be measured by the linear foot of 4 inch wide line. Wider striping will be measured in multiples of 4 inches.

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

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

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

Payment will be made under:

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

(05/23/05)R246usco04

SECTION 702

ASPHALT MATERIALS

Special Provisions

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

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

(10/26/05)R199USC04

SECTION 703

AGGREGATES

Special Provisions

703-2.03 AGGREGATE FOR BASE. Delete Table 703-2 and substitute the following:

TABLE 703-2
AGGREGATE FOR UNTREATED BASE
Percent Passing By Weight

Sieve Designation	Grading C-1	Grading D-1	Grading E-1
1 ½ inch	100		
1 inch	70-100	100	100
¾ inch	60-90	70-100	70-100
3/8 inch	45-75	50-79	50-85
No. 4	30-60	35-58	35-65
No. 8	22-52	20-47	23-50
No. 30	10-33	10-26	13-31
No. 50	6-23	6-19	10-26
No. 200	0-6	0-6	8-15

(10/26/05)R199USC04

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

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

		Type IIA, IV	Type I, IIB, III	Type V	Type VH
LA Wear, % max	AASHTO T 96	45	45	45	45
Degradation Value, min	ATM 313	30	30	30	30
Sodium Sulfate Loss % max (5 cycles)	AASHTO T 104	9	9	9	9
Fracture, min %	WAQTC FOP for AASHTO TP61	90,2 face	80, 1 face	98, 2 face	98, 2 face
Thin-Elongated Pieces, max % **1:5** **1:3**	ATM 306	 8 20	 8 -	 3 8	 3 8
Nordic Abrasion, max.%	ATM 312			12	8
Absorption, max. %	AASHTO T85	2.0		2.0	2.0

TABLE 703-3
BROAD BAND GRADATIONS FOR ASPHALT CONCRETE PAVEMENT AGGREGATE

Percent Passing by Weight

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

(10/26/05)R199USC04

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

For Type IV, V and VH mixes, remove natural fines passing a #4 sieve before crushing aggregates for this asphalt concrete mixture. Consist entirely of aggregate produced from aggregate crushing process and be non-plastic as determined by WAQTC FOP for AASHTO T 90, and meets the following:

Property	Test Method	Requirement

Fine Aggregate Angularity	AASHTO T 304	45% min.

(10/26/05)R199USC04

SECTION 707

METAL PIPE

Standard Modification

Delete Subsection 707-2.07 and replace with the following:

707-2.07 GALVANIZED STEEL WATER CONDUIT. Meet the following:
Galvanized Pipe ASTM A 53 or ASTM A 120, galvanized per AASHTO M 111
Galvanized Fittings ASTM A 234 galvanized per AASHTO M 232.
(06/30/04)E17

SECTION 712

MISCELLANEOUS

Special Provisions

712-2.06 FRAMES, GRATES, COVERS, AND LADDER RUNGS. Add the following:

Ductile iron castings	ASTM A536 for grade 60-401.

(02/22/00)R78M98

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

712-2.17 METHYL METHACRYLATE PAVEMENT MARKINGS. Delete the first and second paragraphs under item 1. Quality Requirements: and substitute with the following: Use a marking material formulated for the application type specified. Use a marking material manufactured from new materials and free from dirt and other foreign material. Use a methyl methacrylate based resin system for part "A". Use benzoyl peroxide system for part "B".

Type A – Spray application: Material formulated for spray application without factory intermix beads or anti skid aggregate. Use glass beads and aggregate designed to be applied to freshly applied material to meet the specified retroreflectance and anti-skid properties, such as Dura-Stripe Plus Type V or approved equal.

Type B – Extruded application: Material formulated for extruded application with factory intermix beads and anti skid aggregate, and additional surface applied beads, such as Dura-Stripe Plus Type III or approved equal.

Type C – Spray or Extruded: Material formulated for spray or extruded application with factory intermix beads and anti skid aggregate and additional surface applied beads, such as Dura-Stripe Plus Types I, III or IV.

2. Performance Properties: Add the following:

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

712-2.18 GLASS BEADS FOR METHYL METHACRYLATE PAVEMENT MARKINGS. Delete the bead table and substitute the following: Use the type and amount of beads specified in writing by the marking material manufacturer necessary to meet the performance requirements. (05/23/05)R246usco04

SECTION 724

SEED

Special Provisions

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

TABLE 724-1
WILDFLOWER SEED MIX REQUIREMENTS

Species	% Weight	Sproutable Seed* %, Min.
Festuca rubra Arctared Red Fescue	45	85
Lupinus nootkantensis Nootka Lupine	7	90
Lolium multiflorum Annual Ryegrass	10	98
Deschampsia beringensis 'Norcoast' "Norcoast" Bearing Hairgrass	15	85
Achillea borealis Northern Yarrow	10	95
Silene armeria Catchfly	8	95
Chrysanthemum arcticum Alaska Daisy	5	81

* Sproutable Seed is the mathematical product of Germination and Purity.

SECTION 726

TOPSOIL

Special Provisions

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

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

(02/25/05)R139USC

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

SECTION 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. For the design and fabrication of high tower poles, see subsection 740-2.04.

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

   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 °F, then completely submerge in one dip in a separate kettle of prime western grade zinc heated to approximately 825 °F. Galvanize bolts and fasteners to meet AASHTO M 232.

After the poles and mast arms are galvanized, remove all excess zinc from all drip lines and points and the surfaces of all tube ends that form slip type joints to provide a smooth finish.

The Department will reject poles and mast arms that are:

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 ¼ inch high text, 3/8 inch of space between successive lines of text, and at least 3/8 inch of space between the edges of the tag and the text. Secure the tags with two 1/8 inch blind rivets at the base of poles and the under side of mast arms. If furnishing a two piece signal mast arm with slip type joint, mark both pieces with the same message.

TABLE 740-1

POLE MARKINGS

Note: *Italic type indicates additional Tag Markings if poles have 2 luminaire or 2 signal mast arms.*

	MEASUREMENTS	**TAG MARKINGS**
Signal Poles		
a) Signal mast arm length	45 ft./*55 ft.*	SMA 45/*SMA 55*
b) Luminaire mast arm length	22 ft./*18 ft.*	LMA 22/*LMA 18*
c) Pole height	36 ft.	PH 36
d) Intersection number (if more than one) -pole number		1 - P 4
e) Sum of signal mast arm moments about centerline of signal pole		SM 4000/*SM 3200*
f) Design wind speed	100 mph	DWS 100
Light Poles		
a) Luminaire mast arm length	15 ft./*15 ft.*	LMA 15/*LMA 15*
b) Pole height	37 ft.	PH 37
Signal Mast Arm		
a) Mast arm length	40 ft.	SMA 40
b) Intersection number (if more than one) -pole number		1 - P 4

TABLE 740-1 POLE MARKINGS		
Note: *Italic type indicates additional Tag Markings if poles have 2 luminaire or 2 signal mast arms.*		
	MEASUREMENTS	**TAG MARKINGS**
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 740-2.04 with the following:

740-2.04 HIGH TOWER POLES.

1. Design. Design and fabricate high tower lighting poles to conform to the 2001 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, 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 the criteria to which the poles are designed and the details for building the poles, including: materials specifications, slip fit joint dimensions, dimensions of the tube segments and other components, the total weight of each segment, the welds that will be made, and the welding inspection that will be done.

   The pole manufacturer shall submit a pole installation plan that details the work required to assemble each pole, the locations of timber supports during and after pole assembly. Submit this plan with the stamped plans and calculations.

   Submit the mill certifications for steel items (piles, plates, bolts, and other related items) to the Engineer for approval.

Design high tower poles for a 50 year design life and the basic wind speed shown in the 2001 AASHTO Standard Specifications for Structural Supports or for 100 mph, whichever is greater. Use a gust effect factor of 1.14.

For fatigue design, use fatigue category I importance factors for lighting poles, and design poles that taper less than 0.14 inches of diameter per foot to resist the effects of vortex shedding.

Furnish poles fabricated from tapered steel tubes with a round, 16 sided, or 12 sided cross section. Use no more than four tapered tube segments with slip type field splices to form each pole. For the slip type joints, provide a minimum overlap of 24 inches or 1.5 times the inside diameter of the female section whichever is larger.

Furnish poles that allow the luminaire ring to descend within five feet of the base plate.

Design poles to support a load that consists of the lowering device and ten luminaires equipped with light shields. Use the following values for these components.

Component	Effective Projected Area	Weight
One lowering device	8.6 ft^2	309 lbs
Ten luminaires	21.5 ft^2	617 lbs
Ten light shields	30.0 ft^2	22 lbs

2. Fabrication. Provide a reinforced rectangular hand hole that provides an opening large enough to install the winch assembly.

Provide a detachable door over the hand hole frame including hinges, nuts to fasten the door to the frame, and a neoprene gasket to provide a watertight seal around the frame. Provide for a locking mechanism for the hand hole door.

Fabricate the base plate to match the bolt circle diameter and the quantity and size of anchor bolts of the foundation detailed on the Plans. The anchor bolts conform to ASTM F 1554, Grade 55 with Supplemental Impact Test Requirements of Section S4. The distance from bottom of the leveling nut to the top of the concrete of the anchor bolts will not exceed one inch.

Install a hook to the left of the hand hole for storing the winch control cable away from the top of the foundation. Provide a 1 inch wide hook that features rounded edges, a 1½ inch radius, and 3 inches between the low point and free end of the hook.

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.

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 segments to form continuous straight seams from the base to the top of the pole. The Department will not accept poles and mast arms made with laminated steel elements.

The Department does not allow holes made for lifting purposes in the ends of tubular segments. To add lift points, weld them at least 12 inches away from welds on the outside of female segments and on the inside of male segments. Before shipment, remove all added lift points, grind the area smooth with the base metal, and hot stick repair the finish according to subsection 660-3.01.8.a.

Provide the mounting brackets needed to install the luminaire ring lowering device, including the winch assembly, associated hardware, and the masthead assembly.

Around the top of each pole, provide a stabilizer system that prevents the luminaire ring from swinging freely when the top of the ring is within 24 inches of being fully docked in the masthead fitting. The stabilizer system shall consist of at least three crooked F shaped brackets located symmetrically around each pole. The brackets shall form a tapered bottom section and a parallel top section that restricts ring movement. Bolt each bracket to two channels welded to the pole shaft. With the Eagle lowering device, locate the brackets between the wheels that line the luminaire ring. Design and fabricate the brackets from stainless steel tubing to withstand the load and wind speed used to design the poles. The installed brackets shall just fit through a circle two inches smaller in diameter than the inside diameter of the luminaire ring.

3. Welding. Perform welding to conform to subsection 504-3.01 8. Welding and the following:

   a. Make welds continuous.

   b. Use CJP groove welds on longitudinal seams within six inches of CJP circumferential welds.

   c. In the ends of those segments that form a slip type joint, provide CJP longitudinal seam welds at least 12 inches longer than the length of the joint.

   d. 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.

e. Use socket type joints with two fillet welds to connect the pole top plates to tubes with walls less than 5/16 inch thick.

f. Use partial joint penetration (PJP) welds in longitudinal seams between the segments of CJP welds. PJP welds must provide at least 60% penetration.

g. Use PJP and fillet welds to attach hand-hole frames to the tube.

h. On steels 5/16 inch thick and thicker, inspect 100 Percent of CJP welds by either radiography (RT) or ultrasound (UT).

j. 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.

Weld tags on the ends of segments that form slip type joints to facilitate field assembly. Locate the tags to ensure segment alignment when the tags are aligned. Attach the tags at least 12 inches away from the slip type joint. Include the shop drawing number to which the poles are fabricated and pole length on the tag.

4. Miscellaneous. Finish poles to meet the following requirements. Before they are 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 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 six inches do two things: grind down welds until a radius concentric is feature 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.

5. Rejection. The Department will reject poles containing segments that

a. Are not fabricated according to these specifications and the approved shop drawings,

b. Are bowed with sweeps exceeding ¾ inch throughout the length of

the segment,

c. Are out of round. Segments 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.

d. Do not provide the minimum overlap of 24 inches or 1.5 times the inside diameter of the female section, whichever is larger, in the slip type field splices when the pole is assembled.

6. Galvanization. Hot dip galvanize pole segments and attachments to meet AASHTO M 111 and these specifications. Completely submerge pole segments in one dip in a kettle of concentrated zinc ammonium chloride flux solution heated to 130 °F, then completely submerge in one dip in a separate kettle of prime western grade zinc heated to approximately 825 °F. Galvanize bolts and fasteners to meet AASHTO M 232.

After the poles and mast arms are galvanized, remove excess zinc from drip lines and points and the surfaces of tube ends that form slip type joints to provide a smooth finish.

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 ¾ inch, angular misalignments in any direction to 30 degrees, and parallel misalignment of the conduits to ¾ inch. The fittings shall also include a braided copper bonding jumper equal to an 8 AWG conductor, bushings to prevent scraping the conductors, and a smooth inner sleeve that maintains a constant diameter regardless of conduit alignment.

740-2.11 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.

740-2.13 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 Municipality of Anchorage Signal Maintenance Section (MOA Signal Maintenance) will tie down the conductors in the controller cabinet under Item 660(26) Signal Timings 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(26) Signal Timings and Adjustments.

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 proms 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.

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 740-2.17 with the following:

740-2.17 FLASHING BEACONS. Furnish beacons that consist of one or more traffic signal sections meeting the requirements of subsection 740-2.14 Vehicular Signal Heads. See the Plans for the number, size and color of the signal sections required for each beacon.

Use the flasher in signal controller cabinets to energize beacons that flash continuously and are installed near traffic signals. Otherwise, each flashing beacon controller assembly consists of the following 120 volt ac equipment housed in a NEMA 3R enclosure: a circuit breaker, a radio interference suppressor, a transient voltage suppressor, a NEMA type 3 flasher, neutral and ground busses, and terminal blocks.

Controller assemblies for school zone speed limit sign beacons shall also include a time switch and a second 120 volt ac circuit breaker that protects a thermostat and heater.

The NEMA 3R enclosure shall feature a single shelf and a top hinged cover with a hasp and staple for sealing and locking the cabinet door.

The radio interference and transient voltage suppressors shall meet the requirements of subsections 740-2.11.1.d.(3) and (4), respectively.

Use a solid state NEMA Type 3 flasher meeting the requirements of NEMA Standard TS 1-1989, Traffic Control Systems.

Use 20 ampere, 600 volt barrier type phenolic terminal blocks with plated brass screw type terminals and integral strips can be marked with a pen or pencil.

Furnish an RTC Manufacturing model AP41-L time switch complete with wiring harness, or an approved, calendar programmable, solid-state time switch with liquid crystal display, keyboard, input/output port, and wiring harness. The approved time switch shall:

1. Operate on line voltages from 95 to 135 volts ac, operate in temperatures from -22° F to 165° F, and include a capacitor that provides 48 hours of back up power to retain programming and time when the unit is disconnected from ac voltage.
2. Include a backlit display and provide 2 lines of alphanumeric legend with 16 characters per line. The display shall automatically prompt the operator while programming the device through the keyboard for ease of use.
3. Include an input/output port and keyboard activated special functions that transfer the program to other units and download the program to a printer for a hard copy record of the program.
4. Automatically compensate for changes in Daylight Savings Time and leap years and include a keyboard activated special function to quickly change the dates for the begin and end of Daylight Savings Time.
5. Provide at least 10 basic plans for daily and/or weekly use and at least 200 program steps that are equally divided amongst the actual number of basic plans. Each program step shall be assignable to a single day, weekend, weekday, or every day. The time switch shall also include 20 plans that activate the basic plans to provide one year of time based control.
6. Include at least 4 single pole double throw, relay controlled outputs rated for 15 amperes of resistive load at 115 volts ac. Each pole shall be independently activated for steady on or momentary on and be manually switched on through the keyboard.

When a signal controller cabinet flasher is used to energize a beacon, furnish a two pole, fused block with built in fuse pullers to protect the flasher. Furnish third party certified blocks that hold 13/32" x 1-1/2" midget ferrule fuses, are rated for 30 amperes, and feature tubular screw terminals that accommodate conductors to 8 AWG. Furnish blocks with two fast acting, 3 ampere (BAF-3) fuses and flat bases that can be directly mounted on a dead panel.

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. <u>High tower luminaire.</u>
   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.

f. 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 ½ inch bar molded according to ASTM recommended practice.

Delete subsection 740-2.20, Illumination Control, in its entirety.

740-2.22 HIGH TOWER LUMINAIRE LOWERING SYSTEM. Delete this subsection in its entirety and substitute the following: Furnish an integral luminaire lowering device that is compatible with the high tower design and consists of a head frame assembly, luminaire ring assembly, and winch assembly complete with electric motor.

Provide a technician employed by the lowering device manufacturer, who has a minimum three years experience installing the lowering device, to

1. Teach each crew that assembles the lowering device how to complete the work on the first pole,
2. Oversee the assembly work on the next three poles or until the technician can assure the Engineer the crew can correctly assemble the lowering devices,
3. Teach each crew how to initially adjust each lowering device on the first pole installed,
4. Oversee the adjustment work on the next three installed poles or until the technician can assure the Engineer the crew can correctly adjust the lowering devices,
5. Come back to teach each new crew how to assemble and adjust the lowering system components, if the installation crews change, and
6. Make intermediate and final adjustments to all lowering devices installed under the contract at three, six, and twelve month intervals after the State has accepted the high tower poles.

Furnish a complete service manual with instructions on installation, operation, and maintenance for each lowering device, winch assembly, and power drive system furnished on the project.

Install one of the following high mast lowering devices wired for a single circuit, rated 480 VAC single phase, on each high tower pole shown on the Plans. Furnish all power cords with four #8 AWG conductors.

Furnish each luminaire ring assembly with guide cones (Millerbernd) or tapered positioning pins (Eagle) painted a safety orange color for their full length. Use a 2 component, water borne epoxy paint with gloss finish that you can apply to galvanized steel and provides a tough, abrasion resistant coating rated for exterior use. Complete work according to the paint manufacturer's written instructions, including: preparing the surfaces and tinting, mixing, and applying the paint.

Manufacturer	Model No.	Options to be furnished
Eagle High Mast Lighting Co.	ELC-XX-GV	Hot dip galvanized masthead assembly and transition plate, and integral motor
Millerbernd Manufacturing assembly	SSLD-2	Integral winch and motor

The Plans will indicate the number of luminaires on each pole, each pole's height, and whether FAA approved obstruction lights are required.

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