

SECTION 10 DEFINITION OF TERMS

10-01 GENERAL. The following terms and definitions apply in these Specifications. If a term is not defined, the ordinary, technical, or trade meanings for that term shall apply, within the context in which it is used.

Titles and headings of sections, subsections, and subparts are intended for convenience of reference and will not govern their interpretation. Working titles which have a masculine gender, such as "workman" and "flagman" and the pronouns and adjectives "he", "his" and "him" are utilized in the contract documents for the sake of brevity, and are intended to refer to persons of either sex. Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.

Cited publications refer to the most recent issue, including interim publications, in effect on the date of the Invitation To Bid, unless specified by year or date.

These Specifications are written to the Bidder or Contractor. Unless otherwise noted, all actions required by the specifications are to be performed by the Bidder, the Contractor, or the Contractor's agent.

Some portions of these Specifications are written using imperative mood, abbreviated format, incomplete sentences and/or active voice to communicate the Contractor's responsibilities in a direct and concise manner. Omission of words or phrases such as "a," "an," "the," "the Contractor shall," "unless otherwise specified," or "unless otherwise directed" is intentional. Interpret the Contract as if they were included.

For all Specification language except the General Contract Provisions, whenever anything is, or is to be, done, if, as, or, when, or where "acceptable, accepted, approval, approved, authorized, determined, designated, directed, disapproved, ordered, permitted, rejected, required, satisfactory, specified, submit, sufficient, suitable, suspended, unacceptable, unsatisfactory, or unsuitable," the expression is to be interpreted as if it were followed by the words "by the Engineer" or "to the Engineer."

10-02 ACRONYMS. Wherever the following abbreviations are used in these Specifications or on the Plans, they are to be construed the same as the respective expression represented. :

AAC	<i>Alaska Administrative Code</i>
AASHTO	American Association of State Highway and Transportation Officials
AC	<i>FAA Advisory Circular</i>
ACI	American Concrete Institute
AIA	American Institute of Architects
AIP	Airport Improvement Program
AKOSH	Alaska Occupational Safety and Health
ANSI	American National Standards Institute
AOA	Air Operations Area
AS	<i>Alaska Statute</i>
ASDS	<i>Alaska Sign Design Specifications</i>
ASTM	American Society for Testing & Materials
ATM	Alaska Test Method
ATMM	<i>Alaska Test Methods Manual</i>
CFR	<i>Code of Federal Regulations</i>
CSPP	Construction Safety and Phasing Plan
CTAF	Common Traffic Advisory Frequency
DOLWD	Alaska Department of Labor and Workforce Development
DOT&PF	Alaska Department of Transportation and Public Facilities
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FM	Factory Mutual

FOP	Field Operating Procedure (See <i>Alaska Test Methods Manual</i>)
FSS	Flight Service Station
ICEA	Insulated Cable Engineers Association (formerly IPCEA)
MCL	Materials Certification List
MRP	Mining and Reclamation Plan
NEC	<i>National Electrical Code</i>
NEMA	National Electrical Manufacturers Association
NOTAMs	<i>Notices to Airmen</i>
RASSO	Regional Airport Safety and Security Officer
SPCC	<i>Spill Prevention, Control, and Countermeasure (Plan)</i>
SPCD	Safety Plan Compliance Document
SSAC	<i>DOT&PF Standard Specifications for Airport Construction</i>
SSPC	Society for Protective Coatings
SWPPP	<i>Storm Water Pollution Prevention Plan</i>
TCP	<i>Traffic Control Plan</i>
UL	Underwriters Laboratory
WAQTC	Western Alliance for Quality in Transportation Construction (See <i>Alaska Test Methods Manual</i>)

10-03 DEFINITIONS.

ACCEPTANCE SAMPLING AND TESTING. Sampling and testing performed by the State of Alaska, or its designated agent, to evaluate acceptability of the final product.

ACCESS ROAD. The right-of-way, the roadway, and all improvements constructed thereon connecting the airport to another public thoroughfare.

ADDENDA. Clarifications, corrections, or changes to the Plans, Specifications, or other Contract documents issued graphically or in writing by the Department after the advertisement but prior to bid opening.

ADVERTISEMENT. The public announcement, as required by law, inviting bids for specified work or materials.

ADVISORY CIRCULAR (AC). FAA standards and guidance for their Airport Improvement Program.

AGREED PRICE. An amount negotiated between the Department and the Contractor after Contract award for additional work performed or additional materials supplied under the Contract.

AIR OPERATIONS AREA (AOA). Any area of the airport used or intended to be used for the landing, takeoff, surface maneuvering, or parking of aircraft. An air operation area shall include such paved or unpaved areas, that are used or intended to be used for the unobstructed movement of aircraft, in addition to its associated runway, taxiway, or apron.

AIRPORT. An area of land or water that is used or intended for use for the landing and takeoff of aircraft, and any appurtenant areas that are used or intended for use for airport buildings or other airport facilities or right of way, together with airport buildings and facilities.

AIRPORT IMPROVEMENT PROGRAM (AIP). A grant-in-aid program, administered by the FAA.

ALASKA STANDARD PLAN. Detail drawing adopted by the Department for repetitive use, showing details to be used where appropriate. Alaska Standard Plans are adopted as Alaska's accepted standards, in accordance with AS 19.10.160(a), and for use in conformity with 12 AAC 36.185(a)(2).

ALASKA TEST METHODS MANUAL (ATMM). The materials testing manual used by the Department. It contains Alaska Test Methods, WAQTC Test Methods, WAQTC FOPs for AASHTO Test Methods, and Alaska Standard Practices for evaluating test results and calibrating testing equipment.

ALASKA TRAFFIC MANUAL. The standard for traffic control devices on Alaska roads, per AS 28.01.010(d). The Alaska Traffic Manual is comprised of the Manual on Uniform Traffic Control Devices (MUTCD) published by the Federal Highway Administration as modified by the Alaska Traffic Manual Supplement, and any adopted revisions or interim addenda issued subsequently and corrections to known errors in either document.

AVIATION MATERIALS CERTIFICATION LIST. See Materials Certification List.

AWARD. Acceptance of the successful bid by the Department. The award is effective upon execution of the Contract by the Contracting Officer.

BASE COURSE. One or more layers of specified material placed on a subbase or subgrade to support a surface course.

BID (OR PROPOSAL). The bidder's offer, on the prescribed forms, to perform the specified work at the prices quoted.

BID BOND. A type of bid guaranty.

BIDDER. An individual, firm, corporation, joint venture, or any acceptable combination of individuals and entities submitting a bid for the advertised work.

BID FORMS. Department-furnished forms that a bidder must complete and submit when making a bid in response to an advertised project. Bid forms may include a bid schedule, certification forms, acknowledgment forms, and other documents.

BID GUARANTY. The security furnished with a bid to guarantee that the bidder will enter into a contract if the Department accepts the bid.

CALENDAR DAY. Every day shown on the calendar, beginning and ending at midnight.

CHANGE ORDER. A written order by the Department to the Contractor making changes to the Contract, within its general scope, and establishing the basis of payment and time adjustment, if any, for the work affected.

COMMON TRAFFIC ADVISORY FREQUENCY (CTAF). A designated frequency for the purpose of carrying out airport advisory practices while operating to or from an airport that does not have a control tower or an airport where the control tower is not operational. CTAF is identified in appropriate aeronautical publications such as the current *FAA Chart Supplement Alaska*, a civil/military flight information publication issued by FAA every 56 days.

COMPLETION DATE. The date on which all Contract work is specified to be completed.

CONSTRUCTION. Physical activity by the Contractor or any Subcontractor using labor, materials or equipment within the Project, or within material sources planned for use on the Project.

CONSTRUCTION SAFETY AND PHASING PLAN (CSPP). The overall plan for safety and phasing of a construction project developed by the Department and approved by the FAA. It is included in the invitation for bids and becomes part of the project specifications.

CONTINGENT SUM. A method for paying for a Contract bid item reserved by the Department for specified contingencies. The Contractor shall perform Contingent Sum work only upon the Directive of the Engineer. The basis of payment for Contingent Sum work shall be specified in the Contract or the Directive.

CONTRACT. The written agreement between the Department and the Contractor setting forth the obligations of the parties for the performance and completion of the work.

The Contract includes the Invitation To Bid, Bid Form, Standard Specifications, Special Provisions, Plans, Bid Schedule, Contract Forms, Contract Bonds, Addenda, and any Change Orders, Interim Work Authorizations, Directives, or Supplemental Agreements that are required to complete the work in an acceptable manner, all of which constitute one instrument.

CONTRACTING OFFICER (PROCUREMENT OFFICER). The person authorized by the Commissioner of the Department to enter into and administer the Contract on behalf of the Department. The Contracting Officer has authority to make findings, determinations, and decisions with respect to the Contract and, when necessary, to modify or terminate the Contract. The Contracting Officer is identified on the Invitation To Bid.

CONTRACT ITEM (PAY ITEM). A specifically described item of Contract work listed on the Bid Schedule or in a Change Order.

CONTRACTOR. The individual, firm, corporation, joint venture, or any acceptable combination of individuals and entities contracting with the Department for performance of the Contract.

CONTRACT TIME. The time allowed under the Contract, including authorized time extensions, for the completion of all work by the Contractor.

CONTROLLING ITEM. Any feature of the work considered at the time by the Engineer: (1) essential to the orderly completion of the work and (2) a feature which, if delayed, will delay the time of completion of the Contract (such as an item of work on the critical path of a network schedule).

COST. Amounts actually incurred by the Contractor in the performance of the Contract that are (a) actually reflected in contemporaneously maintained accounting or other financial records and (b) supported by original source documentation. Costs are to be stated in U.S. dollars.

CULVERT. A pipe or arch half pipe, that provides an opening under the embankment.

DAY. Calendar day unless preceded by the word "working".

DEPARTMENT. The State of Alaska Department of Transportation and Public Facilities.

DIGITAL SIGNATURE. An electronic signature that conforms to the Uniform Electronic Transactions Act, AS 09.80.010 et seq.

DIRECTIVE. A written communication to the Contractor from the Engineer enforcing or interpreting a Contract requirement or ordering commencement or suspension of an item of work already established in the Contract.

DRAINAGE SYSTEM. The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.

ELECTRONIC BID. A bid that a bidder (i) prepares on the Department's bid forms accessed through the Department's approved online bidding service and (ii) submits to the Department through use of that bidding service's online submittal process.

ELECTRONIC MAIL (EMAIL). A system for sending messages from one person to another via telecommunications links between computers or terminals using dedicated software.

ENGINEER. The authorized representative of the Department's Contracting Officer. The Engineer is responsible for administration of the Contract.

EQUIPMENT. All machinery, tools, apparatus, and supplies necessary to preserve, maintain, construct, and complete the work.

EQUITABLE ADJUSTMENT. An increase or decrease in Contract price or time calculated according to the terms of this Contract.

EXTRA WORK. An item of work not provided for in the Contract as awarded but found essential by the Engineer for the satisfactory completion of the Contract within its intended scope.

FEDERAL AVIATION ADMINISTRATION (FAA). Branch of the U.S. Department of Transportation. When used to designate a person, FAA shall mean the Administrator or their duly authorized representative.

FEDERAL SPECIFICATIONS. The most current version of the Federal Specifications and Standards, Commercial Item Descriptions, and supplements, amendments, and indices thereto which are prepared and issued by the General Services Administration (GSA) of the Federal Government in effect on the date bids are opened.

FOREIGN OBJECT DEBRIS (FOD). Any object, live or not, located in an inappropriate location in the airport environment that has the capacity to injure airport or air carrier personnel and damage aircraft.

HIGHWAY, STREET, OR ROAD. A general term denoting a public way used by vehicles and pedestrians, including the entire area within the right-of-way.

HIGHWAY TRAFFIC CONTROL PLAN. See traffic control plan.

HOLIDAYS. State of Alaska legal holidays are:

- a. New Year's Day - January 1
- b. Martin Luther King, Jr. Day - Third Monday in January
- c. Presidents' Day - Third Monday in February
- d. Seward's Day - Last Monday in March
- e. Memorial Day - Last Monday in May
- f. Independence Day - July 4
- g. Labor Day - First Monday in September
- h. Alaska Day - October 18
- i. Veteran's Day - November 11
- j. Thanksgiving Day - Fourth Thursday in November
- k. Christmas Day - December 25
- l. Every Sunday
- m. Every day designated by public proclamation by the President of the United States or the governor as a legal holiday.

If a holiday listed above falls on a Saturday then that Saturday and the preceding Friday are both legal holidays for officers and employees of the state. If the holiday falls on a Sunday, except (12) above, then that Sunday and the following Monday are both legal holidays.

INSPECTOR. An authorized representative of the Engineer assigned to make all necessary inspections, observations, and/or tests, observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.

INTERIM WORK AUTHORIZATION. A written order by the Engineer initiating changes to the Contract, within its general scope, until a subsequent Change Order is executed.

INVITATION TO BID. The advertisement for bids for all work or materials on which bids are required.

LABORATORY. The official testing laboratories of the Department or such other laboratories as may be designated by the Engineer.

LIGHTING. A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.

MAJOR CONTRACT ITEM. A Contract item for which the Contractor's Bid Amount is 5 percent or more of the total Contract award amount. Determination of a Major Contract Item is made at the time of Award.

MANUAL BID. A bid that a bidder (i) prepares on the Department's bid forms accessed either through the Department's approved online bidding service or obtained from the Department's Regional Contracts Office and (ii) submits to the Department in physical paper form by hand delivery, U.S. Mail, or courier service.

MATERIALLY UNBALANCED BID. A mathematically unbalanced bid that either (a) gives rise to a reasonable doubt that it will ultimately result in the lowest overall cost to the Department, even though it may be the lowest bid or (b) is so unbalanced as to be tantamount to allowing a significant advance payment.

MATERIALS. Substances specified for use in the construction of the project.

MATERIALS CERTIFICATION LIST (MCL). Also referred to as "Aviation Materials Certification List". A list of materials for which the Contractor shall submit certifications to the Engineer. The MCL will also designate electrical products requiring listing by an approved independent electrical testing laboratory. The MCL is included in the Contract documents as an appendix.

MATHEMATICALLY UNBALANCED BID. A bid (a) where each pay item fails to carry its share of the cost of the work plus the bidder's overhead and profit, or (b) based on nominal prices for some pay items and enhanced prices for other pay items.

MINOR CONTRACT ITEM. A Contract item with a total value of less than 5 percent of the Contract award amount.

NON-FROST SUSCEPTIBLE. Stone, gravel or sand, that contains 6 percent or less material passing the No. 200 screen as determined by sieve analysis performed with ATM 304 on the minus 3-inch material, and has a plastic index of 6 or less as determined by ATM 205.

NOTICE OF INTENT TO AWARD. The written notice by the Department announcing the apparent successful bidder and establishing the Department's intent to award the Contract when all required conditions are met.

NOTICE TO PROCEED. Written notice to the Contractor to begin the Contract work.

ORIGINAL GROUND (OG). The ground surface prior to the start of work.

PAVEMENT STRUCTURE. The combination of subbase, base course, and surface course placed on a subgrade to support and distribute the traffic load. Some layers may not be present, see Plans.

PAYMENT BOND. The security furnished by the Contractor and the Contractor's Surety to guarantee payment of all persons who supply labor and material in prosecution of the work provided for in the contract.

PERFORMANCE BOND. The security furnished by the Contractor and the Contractor's Surety to guarantee performance and completion of the work provided for in the contract.

PLANS. The Department's contract drawings, profiles, typical cross sections, and supplemental drawings or reproductions showing the location, character, dimensions, and details of the work.

PRECONSTRUCTION CONFERENCE. A meeting between the Contractor and the Engineer to discuss the project before the Contractor begins the work.

PROCESS CONTROL. See quality control.

PROCUREMENT OFFICER. See contracting officer.

PROFILE. The vertical elevation of the surface of the layer at the location indicated. It is typically indicated at the longitudinal centerline of the top layer of pavement on the runway, taxiway, apron, or roadway. On a material or fabrication it may be used to indicate a shape, or a thickness of material or thickness of a coating.

PROJECT. (a) The specific section of the airport or other property and related facilities on which construction is to be performed, or (b) the work that is to be performed under the Contract whether completed or partially completed.

QUALIFIED PRODUCTS LIST. A list of products that the Department has found conforms to the SSAC, except for Buy American and Alaska Agricultural/Wood Products. The Department makes no guarantee that any product on the Qualified Products List meets the requirements of Subsection 60-09 Buy American Steel and Manufactured Products, or Alaska Agricultural/Wood Products.

QUALITY CONTROL (QC) also called **PROCESS CONTROL.** The system used by a contractor to monitor, assess and adjust their production or placement processes to ensure that the final product will meet the specified level of quality. Quality control includes sampling, testing, inspection and corrective action (where required) to maintain continuous control of a production or placement process.

RESOURCES. Labor, equipment, materials, supplies, tools, transportation, and supervision necessary to perform the work.

RESPONSIBLE BIDDER. A bidder that the Department determines has the skill, ability, financial resources, legal capacity to contract, equipment, required licenses, integrity, satisfactory record of performance and that is otherwise fully capable of performing the Contract.

RESPONSIVE BID. A bid that the Department determines conforms in all material respects with the solicitation for bids.

RETAINAGE. A percentage of a payment established in advance under a contract or subcontract to be withheld from a progress payment due on the contract or subcontract. Payment or a percentage of payment withheld for unsatisfactory performance is not retainage.

RIGHT-OF-WAY. Land or property or an interest in property available for a project. The uses allowed in portions of right-of-way may be restricted.

RUNWAY. The area of the airport prepared for the landing and takeoff of aircraft.

RUNWAY SAFETY AREA (RSA). A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event an aircraft undershoots, overshoots, or departs from the runway.

SAFETY PLAN COMPLIANCE DOCUMENT (SPCD). A document prepared by the Contractor that details how the Contractor will comply with the CSPP, and approved by the Department.

SECURITY PLAN. A Contract document that specifies methods of controlling the operations of the Contractor, subcontractors, and suppliers so as to provide for (1) security of workers, equipment, and public, (2) security of aircraft in the Air Operations Areas of the airport, and (3) security of the Airport property.

SPECIAL PROVISION. Addition or revision that amends or supersedes the Standard Specifications and is applicable to an individual project.

SPECIALTY ITEM. A Contract item identified in the Contract that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract.

SPECIFICATIONS. General term applied to all Contract terms, conditions, directions, provisions, and requirements.

STANDARD SPECIFICATIONS. A book or electronic file of specifications approved by the Department for general application and repetitive use.

STATE. The State of Alaska, acting through its authorized representative.

STRUCTURE. Bridge, building, catch basin or inlet, cribbing, culvert, electrical duct, flexible and rigid pavements, handholes, junction boxes, lighting fixture and base, manhole, navigational aid, retaining wall, storm and sanitary sewer lines, transformer, underdrain, vault, visual aid, water line, and other manmade features of the airport that may be encountered in the work and not otherwise classified herein.

SUBBASE. Layer of specified material between the subgrade and base course.

SUBCONTRACTOR. Individual or legal entity to whom or to which the Contractor sublets part of the Contract.

SUBGRADE. The soil or embankment upon which the pavement structure is constructed.

SUBSIDIARY. Work or material not measured or paid for directly. Compensation for such work is included in the payment for other items of work.

SUBSTANTIAL COMPLETION. The point at which the project (1) can be safely and effectively used by the public without further delays, disruption, or other impediments; and (2) pavement structure, shoulder, drainage, sidewalk, permanent signing and markings, guardrail and other traffic barrier, fencing, safety appurtenance, structures, utilities, lighting, bridge deck and parapet work, and guidance systems for aircraft is complete.

For projects built in phases the work is substantially complete when it is ready for the subsequent project.

SUPERINTENDENT. The Contractor's authorized representative in responsible charge of the work.

SUPPLEMENTAL AGREEMENT. Negotiated written agreement between the Department and the Contractor authorizing performance of work beyond the general scope of, but in conjunction with, the original Contract. Supplemental agreements are new procurements under the State Procurement Code, AS 36.30.

SURETY. Corporation, partnership, or individual, other than the Contractor, executing a bond furnished by the Contractor.

SURFACE COURSE. Top homogenous layer of the pavement structure. It is designed to withstand the wear of traffic and the disintegrating effects of climate. Sometimes called the wearing course.

TAXIWAY. The portion of the air operations area of an airport that has been designated for movement of aircraft to and from runways or aircraft parking areas.

TAXIWAY SAFETY AREA (TSA). A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TRAFFIC CONTROL PLAN (TCP). Also referred to as "Highway Traffic Control Plan". A drawing or drawings indicating the method for safely guiding and protecting motorists, pedestrians, bicyclists, and workers in a highway traffic control zone. The TCP depicts the highway traffic control devices and their placement and times of use.

UTILITY. Line, facility, or system for producing, transmitting, or distributing communications, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway drainage, or other similar commodity, including a publicly owned fire or police signal system, street lighting system, or railroad which directly or indirectly serves the public. Also means lighting as defined in this subsection. Also means a utility company, inclusive of any subsidiary.

VERIFICATION SAMPLING AND TESTING. See ACCEPTANCE SAMPLING AND TESTING.

WORK. Depending on the context, (a) The act of furnishing all resources for the project and performing all duties and obligations required by the Contract or (b) the physical construction, facility or end-product that is contemplated under the Contract, whether completed or partially completed.

WORKING DAYS. Calendar days, except Saturdays and state holidays.

WORKING DRAWINGS. Stress sheets, shop drawings, erection plans, falsework plans, framework plans, cofferdam plans, bending diagrams for reinforcing steel, wiring diagrams and schematics, traffic control plans, or any other supplementary plans or similar data which the Contractor is required to submit to the Engineer for approval.

SECTION 50 CONTROL OF WORK

50-01 AUTHORITY OF THE ENGINEER. The Engineer has immediate charge of the engineering details of the project and is responsible for Contract administration. The Engineer has authority to reject defective material and suspend work not performed in accordance with the Contract. The Engineer has authority to accept completed work, issue Directives, Interim Work Authorizations, and Change Orders, and recommend Contract payments.

The Engineer will decide all questions about the quality and acceptability of the materials furnished and whether the work performed by the Contractor was in accordance with the Contract, the Contractor's rate of progress, Contract interpretation and all other questions relating to Contract compliance.

The Engineer has authority to suspend work for reasons listed under Subsection 80-06. If the suspension is to protect the traveling public from imminent harm, the Engineer may orally order the suspension of work. Following an oral order of suspension, the Engineer will promptly give written notice of suspension to the Contractor. In other circumstances, the Engineer will give the Contractor written notice of suspension before suspension of work. A notice of suspension will state the defects or reasons for a suspension, the corrective actions required to stop suspension, and the time allowed to complete corrective actions. If the Contractor fails to take the corrective action within the specified time, the Engineer may:

- a. Suspend the work until it is corrected; and
- b. Employ others to correct the condition and deduct the cost from the Contract amount.

The Engineer may, at reasonable times, inspect any part of the plant or place of business of the Contractor or any subcontractor that is related to Contract performance, including private or commercial plants, shops, offices, or other places of business.

The Engineer may audit all books and records related to performance of the Contract, whether kept by the Contractor or a subcontractor, including cost or pricing data submitted under Subsection 40-02.

50-02 PLANS AND WORKING DRAWINGS. The Department shall provide the Contractor at least two full size sets of the conformed Plans and Contract including Special Provisions. If cross-sections are available, one set will be provided if requested in writing by the Contractor. The Contractor shall keep a complete set of these documents available on the project site at all times.

The Contractor shall supplement structure plans with working drawings that include all details that may be required to adequately control the work and that are not included in the Plans furnished by the Department. The Contractor shall not perform work or order materials until the working drawings for such work, or for changes, are approved by the Engineer. The Engineer's approval of working drawings or changes shall not be deemed a determination that the working drawings or changes comply with federal, state or local laws, rules, regulations and ordinances. It is Contractor's duty to ensure the working drawings comply with the Contract and any applicable federal, state or local laws, rules, regulations, and ordinances.

The Contractor shall submit to the Engineer for approval any required preliminary detail or working drawings. The project name and number shall be stated in the title block for all drawings, as shall the state bridge number, when applicable. The Contractor shall submit drawings in either an electronic or paper format that is acceptable to the Engineer. When paper copies are submitted, provide three sets.

The Contractor shall submit drawings to the Engineer in time to allow for review and correction before beginning the work detailed in the drawing. The Engineer shall return one set of these drawings, either approved or marked with corrections to be made, and shall retain the other sets. The Engineer's approval of working drawings does not change the Contract requirements or release the Contractor of the responsibility for successful completion of the work.

The Contractor is responsible for the accuracy of dimensions and details and for conformity of the working drawings with the Plans and Specifications. The Contractor shall indicate clearly on the working drawings any intended deviations from the Plans and Specifications and itemize and explain each deviation in the Contractor's transmittal letter. The Engineer may order the Contractor to comply with the Plans and Specifications at the Contractor's sole expense if the approved working drawings deviate from the Plans and Specifications and the Contractor failed to itemize and explain the deviations in the Contractor's transmittal letter.

Once the Contractor receives approval of the working drawings, the Contractor shall furnish to the Engineer:

- a. Enough additional copies to provide eight approved sets of prints;
- b. One set of reproducible transparencies (polyester film); and
- c. If requested, an electronic file in AutoCAD drawing interchange format (.DXF).

The Contractor shall include the cost of furnishing all working drawings in the Contract price.

50-03 CONFORMITY WITH PLANS AND SPECIFICATIONS. Work performed and materials furnished shall conform to the Plans, Specifications and approved Working Drawings, and be within specified tolerances. When tolerances are not specified, the Engineer will determine the limits allowed in each case.

All work or material not conforming to the Plans, Specifications, and approved Working Drawings is considered unacceptable unless the Engineer finds that reasonably acceptable work has been produced. In this event, the Engineer may allow non-conforming work or material to remain in place, but at a reduced price. The Engineer will document the basis of acceptance and payment by Change Order, unless the contract specifies a method to adjust the price of that item.

The failure of the Department to strictly enforce the Contract in one or more instances does not waive its right to do so in other or future instances.

50-04 COORDINATION OF PLANS, SPECIFICATIONS, AND SPECIAL PROVISIONS. These Standard Specifications, Plans, Special Provisions, and all supplementary documents are essential parts of the Contract. They are intended to complement each other and describe and provide for a complete project. A requirement occurring in one is as binding as if occurring in all.

In case of conflict, calculated dimensions will govern over scaled dimensions. In the event that any of the following listed contract documents conflict with another listed contract document, the order of precedence is (with **a.** having precedence over **b.**, and **b.** having precedence over **c.**, etc.):

- a. Special Provisions
- b. Plans
- c. Standard Specifications
- d. Materials testing standards
- e. FAA Advisory Circulars

The Contractor shall not take advantage of any apparent error or omission in the Contract documents. The Contractor may not base a claim for additional compensation or Contract time on a patent error, omission, or conflict in the Contract documents. The Contractor shall notify the Engineer immediately of any apparent errors or omissions in the Contract documents. The Engineer will make any corrections or interpretations necessary to fulfill the intent of the Contract.

50-05 COOPERATION BY CONTRACTOR. The Contractor shall give the work the constant attention necessary for its progress, and shall cooperate fully with the Engineer, Department staff, and other contractors in every way possible.

Either the Contractor's Superintendent or an acting Superintendent with authority to represent and act for the Contractor shall be available within the proximity of the project whenever work is occurring. The Contractor shall employ, as its agent, a competent superintendent thoroughly experienced in the type of work being performed and capable of reading and thoroughly understanding the Plans and Specifications. The Contractor shall provide 24-hour contact information for the Superintendent. The Contractor shall ensure that the superintendent is available at all times to receive and execute Directives and other instructions from the Engineer, to supervise workers and to coordinate the work of subcontractors. The Contractor shall give the superintendent full authority to supply the resources required. The Contractor shall furnish superintendence regardless of the amount of work sublet.

50-06 UTILITIES.

a. Bid Considerations. Bidders shall include in their bid the cost of:

- (1) Providing uninterrupted operation of all visual and electronic signals, including power supplies and Lighting used in the guidance of aircraft, except as specified in the CSPP and SPCD;
- (2) All utility work that is specified in the Contract as work to be performed by the Contractor;
- (3) Working around or through all permanent and temporary utilities shown on the Plans, in both their present and adjusted positions;
- (4) Accommodating the removal, adjustment, or relocation of utilities shown on the Plans by entities other than the Contractor;
- (5) Construction and removal of temporary utilities, to provide temporary utility service during the construction or repair of a permanent utility; and
- (6) Other utility work not specifically identified as compensable in Subparagraph d Compensation.

The Department will show the approximate locations of utilities it knows to be within the work zone on the Plans. Bidders shall expect that the location, elevation and nature of utilities may vary from what is shown on the Plans and shall factor those contingencies into the bid price. Additional utilities may exist that are not shown on the Plans. Compensation related to utilities not shown on the plans will only be available according to Subparagraph d Compensation.

When an entity other than the Contractor is to remove, adjust, or relocate any utility, or perform other utility related work within the project boundaries, the applicable completion dates or specific calendar days to complete the removal, adjustment, relocation, or other utility related work may be stated in the Special Provisions. If no date is stated in the Special Provisions, the Contractor shall work cooperatively with the utility owner during the Project.

b. Cooperation with Utility Owners. The Contractor assumes the obligation of coordinating their activities with utility owners, and shall cooperate with utility owners to facilitate removal, adjustment, or relocation operations, avoid duplication of work, and prevent unnecessary interruption of services. When a utility owner is identified in the Contract as being responsible for removing, adjusting, or relocating a utility, the Contractor shall give the utility owner 15 days advance written notice regarding the dates when the utility owner is required to begin and end operations.

The Contractor shall cooperate with utility owners to determine a utility progress schedule for all parties' utility work. The Contractor shall submit the schedule to the Engineer before beginning that portion of utility work. The Contractor shall update the utility progress schedule monthly and shall note time delays and their cause.

Utility owners are not required to work in more than one location at a time, and shall be allowed to complete a specific section of work prior to commencing another section. Utility owners will not normally perform adjustment or relocation of underground utilities when the ground is frozen. Utility owners may prohibit the Contractor, through the Engineer, from working near utilities when the ground is frozen.

The Department has sole discretion to grant permits for utility work within the state right-of-way. The Contractor shall allow parties with utility permits to work and make excavations in the project.

If utility owners do not complete their work in a timely manner, the Engineer may direct the Contractor to temporarily relocate the utilities, to construct new utilities, or to make necessary repairs to complete the utility work.

c. Utility Work. The Contractor shall:

- (1) Make all necessary arrangements with utility owners to locate all utilities that may be within an area of work before excavation in that area, according to AS 42.30.400;
- (2) Provide right-of-way staking and construction staking with lines and grades before excavation in that area;
- (3) Prevent damage to utilities or utility property within or adjacent to the project;
- (4) Carefully uncover utilities where they intersect the work;
- (5) Immediately stop excavating in the vicinity of a utility and notify the Engineer and the utility owner if an underground utility is discovered that was not field marked or was inaccurately field marked;
- (6) Promptly notify the utility owner, the Engineer, and the Airport Manager in the event of accidental interruption of utility service, and cooperate with the utility owner and the Engineer until service is restored;
- (7) Take all precautions necessary to protect the safety of workers and the public when performing work involving utilities;
- (8) Follow an approved TCP;
- (9) Keep the length of open trench excavation to a minimum, backfill trenches as work is completed;
- (10) Cover open trenches with metal plates capable of bearing traffic where traffic will cross trenches;
- (11) Maintain continuous utility service and install temporary utility systems where needed;
- (12) Ensure all excavation conforms to AS 42.30.400 – 42.30.490;
- (13) Ensure all excavation and utility work conforms to excavation requirements in 29 CFR 1926, Subpart P, and confined space requirements in 29 CFR 1926.21(b)(6);
- (14) Ensure all work undertaken near energized high voltage overhead electrical lines or conductors conforms to AS 18.60.670, AS 18.60.675, AS 18.60.680 or other applicable law;
- (15) Ensure all work undertaken near energized high voltage underground electric lines or conductors conforms to all applicable laws and safety requirements of the utility owner;

- (16) When required by the utility owner, provide for a cable watch of overhead power, underground power, telephone, and gas;
- (17) Obtain plan approval from the local fire authority, and provide for the continued service of fire hydrants, before working around fire hydrants;
- (18) Do all pressure testing or camera testing required to verify utility acceptance in a timely manner; and
- (19) Coordinate the Storm Water Pollution Prevention Plan (SWPPP) (Item P-641) with their work and the utility companies' work.

d. Compensation.

- (1) Except as otherwise specifically provided in this Subparagraph d, no equitable adjustment will be paid by the Department:
 - (a) Due to any variations in location, elevation, and nature of utilities shown on the Plans, or the operation of removing, adjusting, or relocating them;
 - (b) For any delays, inconvenience, or damage sustained as a result of interference from utility owners, interference from utilities, or interference from the operation of removing, adjusting, or relocating utilities; or
 - (c) For any adjustments or relocations of utilities requested for the Contractor's convenience.
- (2) Except as otherwise specifically provided in this Subparagraph d, the Engineer will issue a Change Order with equitable adjustment if:
 - (a) Utilities not shown on the Plans require removal, adjustment, or relocation;
 - (b) Conflicts occur between utilities not shown on the Plans and other necessary work; or
 - (c) Conflicts due to the required elevation of a utility occur between new and existing utilities that are both shown on the Plans.
- (3) When the Contractor damages utilities, the utility owner may choose to repair the damage or require the Contractor to repair the damage. When the Contractor damages utilities:
 - (a) No equitable adjustment will be paid by the Department, and the Contractor shall be solely responsible for repair costs and expenses, when:
 - 1. The Contractor failed to obtain field locates before performing the work that resulted in the damage;
 - 2. The utility was field located by the utility owner or operator, and the field locate is accurate within 24 horizontal inches if the utility is buried 10 feet deep or less, or the field locate is accurate within 30 horizontal inches if the utility is buried deeper than 10 feet;
 - 3. The plan profile or the field locate does not indicate or inaccurately indicates the elevation of a buried utility;
 - 4. The utility is visible in the field; or
 - 5. The Contractor could otherwise reasonably have been aware of the utility.

- (b) The Engineer will issue a Change Order with an equitable adjustment for the cost of repairing damage if:
 - 1. The field locate by the owner or operator of a buried utility erred by more than 24 horizontal inches if the utility is buried 10 feet deep or less, or 30 horizontal inches if the utility is buried deeper than 10 feet;
 - 2. The utility was not shown on the Plans or other Contract documents, and the Contractor could not reasonably have been expected to be aware of the utility's existence; or
 - 3. The Contractor made a written request for a field locate according to AS 42.30.400, the utility owner did not locate the utility according to AS 42.30.410, and the Contractor could not reasonably have been expected to be aware of the utility's existence or location.
- (4) If a delay is caused by a utility owner, is beyond the control of the Contractor, and is not the result of the Contractor's fault or negligence, the Engineer may issue a Change Order with an equitable adjustment to contract time, but no equitable adjustment will be made for the cost of delay, inconvenience or damage. Additional contract time may be granted if the cause of delay is because a utility owner is to perform utility work:
 - (a) By dates stated in the Special Provisions, and the utility work is not completed by the dates stated; or
 - (b) In cooperation with the Contractor and the utility owner does not complete the work in a timely manner, based on a written progress schedule agreed upon by the Contractor, the utility owner, and the Engineer.
- (5) If the Engineer orders the Contractor to make necessary construction or repairs due to incomplete utility work by utility owners, the Contractor will be paid as specifically provided for in the Contract, or the Engineer will issue a Change Order with equitable adjustment.
- e. **Cooperation with Airport Management and FAA.** The Contractor shall coordinate their activities and cooperate with the Airport Management and the FAA, and shall provide 45 days advance written notice to them before working on utilities in the Air Operations Area. All coordination with Airport Management and the FAA shall be through the Engineer. Refer to the CSPP for coordination requirements. The Contractor shall include and cooperate with Airport Management, the FAA, and the Engineer, in determining a utility progress schedule for work on the Airport Property.

The Contractor shall submit a written plan to repair damaged utilities to the Engineer, and shall follow the plan when repairing damaged utilities. The plan shall identify repair personnel or subcontractors. The Contractor shall not work on or adjacent to utilities unless repair personnel are available to repair damaged utilities. Personnel repairing utilities shall be licensed for the work required, and shall have the tools and material required to repair damaged utilities within the time limits required.

When damage affects, or may in the Engineer's opinion affect, the function of navigational or visual aids, the Contractor shall repair damage within two hours. When damage affects, or may in the Engineer's opinion affect, the function of utilities, the Contractor shall repair the damage within 24 hours.

50-07 COOPERATION BETWEEN CONTRACTORS. The Department may, at any time, contract for and perform other or additional work on or near the Project. The Contractor shall allow other contractors reasonable access across or through the Project.

The Contractor shall cooperate with other contractors working on or near the Project, and shall conduct work without interrupting or inhibiting the work of other contractors. All contractors working on or near the Project shall accept all liability, financial or otherwise, in connection with their Contract. No claim shall be made by the Contractor or paid by the Department for any inconvenience, delay, damage or loss of any kind to the Contractor due to the presence or work of other contractors working on or near the Project.

The Contractor shall coordinate and sequence the work with other contractors working within the same project limits. The Contractor shall properly join the work with work performed by other contractors and shall perform the work in the proper sequence to that of the others. The Contractor shall arrange, place, and dispose of materials without interfering with the operations of other contractors on the same project. The Contractor shall defend, indemnify and save harmless the Department from any damages or claims caused by inconvenience, delay, or loss that the Contractor causes to other contractors.

50-08 SURVEY CONTROL. The Department will provide sufficient horizontal and vertical control data to establish the planned lines, grades, slopes, shapes, and structures. The Contractor shall provide all additional survey work to maintain control during the project.

50-09 DUTIES OF THE INSPECTOR. The Department's inspectors are authorized to examine all work done and materials furnished, but cannot approve work or materials. Only the Engineer can approve work or materials. The inspectors can reject work or materials until any issues can be referred to and decided by the Engineer. The inspectors may not alter or waive any Contract requirements, issue instructions contrary to the Contract or act as foremen for the Contractor.

50-10 INSPECTION OF WORK. All materials and each part and detail of the work shall be subject to inspection by the Department for compliance with the Contract. The Contractor shall allow safe access to all parts of the work and provide information and assistance to the Engineer to ensure a complete and detailed inspection.

Any work done or materials used without inspection by an authorized Department representative may be ordered removed and replaced at the Contractor's expense, unless the Department failed to inspect after being given reasonable written notice that the work was to be performed.

The Contractor shall remove and uncover portions of finished work when directed. After inspection, the Contractor shall restore the work to Contract requirements. The cost to uncover and restore work shall be at the Contractor's expense, except the Department will pay the cost to uncover and restore work if (1) an authorized Department representative had previously inspected the work or the Contractor had provided reasonable prior written notice that the work was to be performed and (2) the Department finds the uncovered work to be acceptable. If the Department finds the uncovered work to be unacceptable, the cost to correct the work, or remove and replace the work, shall be at the Contractor's expense.

Representatives of Contract funding agencies have the right to inspect the work. This right does not make that entity a party to the Contract and does not interfere with the rights of parties to the Contract.

The Department's observations, inspections, tests and approvals shall not relieve the Contractor from properly fulfilling its Contract obligations and performing the work according to the Contract. Work that has been inspected but contains latent or hidden defects shall not be deemed acceptable even though it has been inspected and found to be according to the Contract.

The State of Alaska Department of Labor may require electrical inspection of Public Structures. The Contractor shall request inspection by contacting the Electrical Inspector in Anchorage, Alaska, Phone (907) 269-4925. The Contractor shall request inspection a minimum of two weeks prior to the expected date of inspection being needed. If more than one item requires inspection, the Contractor shall submit a list to the Engineer and Electrical Inspector, with dates for all stages that requires inspection. The Department has no control over or responsibility for the timing of inspections by the Electrical Inspector.

50-11 REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK. All work that does not conform to the requirements of the Contract shall be deemed unacceptable by the Engineer, unless otherwise

determined acceptable under Subsection 50–03. The Contractor shall correct, or remove and replace, work or material that the Engineer deems unacceptable, as ordered by the Engineer and at no additional cost to the Department.

The Contractor shall establish necessary lines and grades before performing work. Work done before necessary lines and grades are established, work done contrary to the Department's instructions, work done beyond the limits shown in the Contract, or any extra work done without authority, will be considered as unauthorized and shall not be paid for by the Department, and may be ordered removed or replaced at no additional cost to the Department.

If the Contractor fails to promptly correct, remove, or replace unacceptable or unauthorized work as ordered by the Engineer, the Engineer may employ others to remedy or remove and replace the work and will deduct the cost from the Contract payment.

50-12 LOAD RESTRICTIONS. The Contractor shall comply with all vehicle legal size and weight regulations of 17 AAC 25 and the *Administrative Permit Manual*, and shall obtain permits from the DOT&PF Division of Measurement Standards & Commercial Vehicle Enforcement before moving oversize or overweight equipment on a state highway.

The Engineer may permit oversize and overweight vehicle movements within the project limits provided the Contractor submits a written request and an acceptable Traffic Control Plan. No overloads will be permitted on a pavement, base or structure that will remain in place in the completed project. The Contractor shall be responsible for all damage done by their equipment due to overloads, and for damage done by a load placed on a material that is curing and has not reached adequate strength to support the load.

50-13 MAINTENANCE DURING CONSTRUCTION. The Contractor shall maintain the airport and related airport facilities located within the project from the date construction begins until the Contractor receives a letter of project completion. The Contractor shall maintain these areas continually and effectively on a daily basis, with adequate resources to keep them in satisfactory condition at all times. The Contractor shall maintain those areas outside the project that are affected by the work, such as haul routes, detour routes, structures, material sites, and equipment storage sites during periods of their use.

Do not place foreign objects and debris (FOD) or any debris capable of causing damage to aircraft landing gears or propellers or of being ingested in jet engines on surfaces in active aircraft movement areas. Ensure that all loose material and debris has been removed from the sides of equipment and haul vehicles prior to travel on airport or road surfaces. Keep all active runway, taxiway, and apron areas free of materials spilled by your operations. Clean spilled materials off of closed runways, taxiways, or aprons prior to opening these areas to aircraft. If FOD is spilled on an active runway, taxiway, or apron, remove it immediately. The Engineer reserves the right to suspend all hauling operations until FOD is removed from active aircraft movement areas. Hauling time lost due to the suspended haul will not be considered reason to extend contract time or reason for a claim. The Engineer will allow hauling to continue when the spilled material is cleaned up to his satisfaction. FOD preventive measures and FOD cleanup of runways, taxiways, haul routes, and equipment is subsidiary to the contract and no additional payment will be made.

The Engineer may relieve the Contractor of this maintenance responsibility for specified portions of the project:

- a. During a seasonal suspension of work. Approximately one month prior to seasonal suspension of work, the Contractor shall hold a preliminary meeting with the Engineer and Airport Management to outline the work the Contractor expects to complete before shut down and the condition the project is to be left in. The Contractor shall then schedule a field review for acceptance by the Department for winter maintenance. At the field review a punch list shall be prepared for implementation prior to acceptance. In order for the Contractor to be relieved of winter maintenance responsibility, the surface of all embankments shall be properly crowned for drainage, all edge lighting shall be in good working order, and all NAVAIDS installed by the Contractor shall first have been accepted by the FAA. After acceptance for winter maintenance and until the Contractor

resumes construction operations, maintenance of the facility agreed upon will be the responsibility of the Department; or

- b. Following partial completion (Subsection 50-14); or
- c. Following project completion (Subsection 50-15).

The Department is responsible for routine snow removal and ice control only on those portions of the project that the Department accepts for maintenance.

The Contractor shall maintain previously constructed work until a subsequent course, layer, or structure covers that work. The Contractor shall repair damage done to the work as described in Subsection 70-15.

All costs of maintenance work shall be subsidiary to the prices bid on the various contract items, and the Contractor will not be paid an additional amount for such work.

If in the Engineer's opinion, the Contractor at any time fails to provide adequate maintenance, the Engineer will notify the Contractor of such noncompliance. The notification will specify the areas or structures for which there is inadequate maintenance, the corrective maintenance required, and the time allowed to complete corrective maintenance. If the Contractor fails to take the corrective action within the specified time, the Engineer may:

- a. Suspend the work until corrective maintenance is completed;
- b. Assess a traffic price adjustment against the Contract Amount when an adjustment rate is specified in the Contract; and
- c. Employ others for corrective maintenance and deduct the cost from the Contract amount.

50-14 PARTIAL COMPLETION. The Contractor may submit a written request for partial acceptance of a substantially complete geographically separate portion of the project. The Engineer will accept the portion in writing before project completion and relieve the Contractor of further maintenance responsibility for the completed work, if the Engineer inspects the portion and finds that it is substantially complete to Contract requirements, and acceptance is in the best interest of the State.

Partial completion of the portion neither voids nor alters any Contract terms.

50-15 PROJECT COMPLETION. The Contractor shall notify the Engineer, in writing, upon substantial completion of all work provided for under the Contract. The Engineer will then schedule and conduct the final inspection. If the inspection discloses that any work is incomplete or unsatisfactory, the Engineer will give the Contractor a list of work items that must be completed or corrected to reach substantial completion and to reach final completion. The Contractor shall promptly complete or correct any work determined unsatisfactory by the final inspection and request a re-inspection.

The Engineer will identify the date of substantial completion in a letter of substantial completion. The letter of substantial completion will relieve the Contractor of further maintenance responsibility of the completed work. The letter of substantial completion will not stop Contract time or relieve the Contractor of the obligation to fully complete the work as required by the Contract specifications.

When all physical work and cleanup provided for under the Contract is found to be complete, the Engineer will issue a letter of project completion. Project completion stops the Contract time, but does not relieve the Contractor of any other Contract obligations.

50-16 FINAL ACCEPTANCE AND RECORD RETENTION. The Department will issue the letter of Final Acceptance after all of the following:

- a. Project completion;

- b. Receipt of all certificates, as-builts, warranties, and other required documents;
- c. Receipt of the Contractor's Release, with no exceptions;
- d. Certification of payment of payroll and revenue taxes by DOLWD and State Dept. of Revenue; and
- e. Final payment under the Contract.

Final Acceptance will release the Contractor from further Contract obligations, except those:

- a. Specified under Subsection 70-19;
- b. Required by law or regulation; or
- c. Continuing obligations established by provisions of this Contract, such as warranty, guaranty, indemnity, insurance, or bond.

The Contractor and the subcontractors shall maintain all books and records relating to performance of the Contract for three years after the date of final payment of the Contract and each subcontract.

50-17 CLAIMS. The Contractor shall notify the Engineer as soon as the Contractor becomes aware of any act or occurrence that may form the basis of a claim for additional compensation or an extension of Contract time or of any dispute regarding a question of fact or interpretation of the Contract. The Engineer has no obligation to investigate any fact or occurrence that might form the basis of a claim or to provide any additional compensation or extension of Contract time unless the Contractor notifies the Engineer in a timely manner of all facts the Contractor believes form the basis for the claim.

If the Contractor believes that he is entitled to an extension of Contract time, the Contractor must state the contract section on which the extension request is based, provide the Engineer with sufficient information to demonstrate that the Contractor has suffered excusable delay, and show the specific amount of time to which the Contractor is claiming entitlement. The Department will not grant an extension of Contract Time if the Contractor does not timely submit revised schedules in accordance with Subsection 80-03.

If the basis of claim or dispute is not resolved by agreement within seven days of the date the Engineer is notified by the Contractor, the Contractor shall within the next fourteen days submit a Contractor Intent to Claim (Form 25D-18) to the Engineer. Failure to submit a Contractor Intent to Claim as required under this section constitutes a waiver of any future claim arising from or relating to the alleged act or occurrence.

If the Contractor believes additional compensation or time is warranted, the Contractor shall immediately begin keeping complete, accurate, and specific daily records concerning every detail of the potential claim including actual costs incurred, and shall give the Engineer access to any such records and furnish the Engineer copies, if requested. Equipment costs must be based on the Contractor's internal rates for ownership, depreciation, and operating expenses and not on published rental rates. In computing damages, or costs claimed for a change order, or for any other claim against the Department for additional time, compensation or both, the contractor must establish actual damages based on internal costs for equipment, labor or efficiencies. Total cost, modified total cost or jury verdict forms of presentation of damage claims are not permitted. Labor inefficiencies must be shown to actually have occurred and can be proven solely based on job records. Theoretical studies are not a permissible means of showing labor inefficiencies. Home office overhead will not be allowed as a component of any claim against the Department.

The Contractor shall submit a written claim to the Contracting Officer within 90 days after the date the Contractor became aware of the basis of the claim or should have known of the basis of the claim, whichever is earlier. Any Claim not filed within this 90-day period will be deemed irrevocably waived by the Contractor, regardless of whether the requested relief is sought for the ultimate benefit of the Contractor or its subcontractor(s). The Contracting Officer will issue a written acknowledgement upon receipt of the claim.

The Contractor waives any right to claim if the Engineer was not notified properly or afforded the opportunity to inspect conditions or monitor actual costs or if the Claim is not filed on the date required.

- a. The written Claim must include all of the following:
- (1) The act, event, or condition giving rise to the claim;
 - (2) The Contract provisions that apply to the claim and that provide for the requested relief;
 - (3) The item or items of Contract work affected and how they were affected;
 - (4) The specific relief requested, including Contract time if applicable, and the basis upon which it was calculated;
 - (5) Revised progress schedules under Subsection 80–03; and
 - (6) A certification signed by the Contractor that to the best of the contractor's knowledge and belief, the data submitted is accurate, complete, and current and is the actual cost to the contractor or additional time for performing the additional work or supplying the additional materials.
- b. The claim, in order to be considered, must show:
- (1) That the Contractor suffered damages or delay;
 - (2) The damages or delay were caused by the act, event, or condition listed in the claim; and
 - (3) That the Contract entitled the Contractor for relief due to the act, event, or condition specified in the Claim.

The Department may request the Contractor to provide additional information relating to the claim at any time before issuing a decision. The Contractor shall provide the Department with the requested additional information within 30 days of receiving a request. Failure to furnish the additional information may be regarded as a waiver of the claim.

The Contracting Officer will issue a decision within 90 days of receipt of all information relating to the claim. The time for the Contracting Officer to issue a decision may be extended according to AS 36.30.620.

The Contracting Officer's decision is final and conclusive unless the Contractor delivers a notice of appeal to the Commissioner within 14 days of receipt of the decision. The Contractor shall also serve a copy of the notice of appeal on the Contracting Officer.

Appeals from a Contracting Officer's decision shall be decided according to the State Procurement Code's appeal procedures, including AS 36.30.625, AS 36.30.627, AS 36.30.630, and AS 36.30.631.

Criminal and civil penalties authorized under AS 36.30.687 (including, but not limited to, forfeiture of all claimed amounts) may be imposed on the Contractor if the Contractor makes or uses a misrepresentation in support of a claim, or defrauds or attempts to defraud the Department at any stage of prosecuting a claim under this Contract.

SECTION 80 EXECUTION AND PROGRESS

80-01 SUBCONTRACTING OF CONTRACT. The Contractor shall submit a Contractor Self Certification, Form 25D-042, and, except on wholly state-funded projects, a completed Certification for Tax Delinquency and Felony Convictions, Form 25D-159, for each Subcontractor and each Lower Tier Subcontractor, before the Contractor or any subcontractor subcontracts, sells, transfers, assigns, or otherwise disposes of the Contract or any portion of the Contract. The Department has authority to review subcontracts and to deny permission to subcontract work. The Department may penalize the Contractor for false statements or omissions made in connection with Form 25D-042.

The Contractor shall perform, with the Contractor's own organization, work amounting to at least 30 percent of the difference between the original Contract price and the price of designated Specialty Items. For the purpose of this subsection, work is defined as the dollar value of the services, equipment, materials, and manufactured products furnished under the Contract. The Engineer will determine the value of the subcontracts based on Contract unit prices or upon reasonable value, if entire items are not subcontracted.

The Department's consent to the subcontracting, sale, transfer, assignment, or disposal of all or a part of the Contract shall not relieve the Contractor and the Surety of responsibility for fulfillment of the Contract or for liability under the bonds regardless of the terms of the transfer or sublet approvals.

- a. The Contractor shall ensure that for all subcontracts (agreements):
 - (1) The Department is furnished with one completed Contractor Self Certification, Form 25D-042, for each subcontract;
 - (2) The subcontractors have submitted a Bidder Registration, Form 25D-6;
 - (3) The required prompt payment provisions of AS 36.90.210 are included in all subcontracts;
 - (4) A clause is included requiring the Contractor to pay the subcontractor for satisfactory performance according to AS 36.90.210 and within eight (8) working days after receiving payment from which the subcontractor is to be paid;
 - (5) A clause is included requiring the Contractor to pay the subcontractor interest, according to AS 45.45.010(a), for the period beginning the day after the required payment date and ending on the day payment of the amount due is made;
 - (6) A clause is included requiring the Contractor to pay the subcontractor all retainage due under the subcontract, within eight (8) working days after final payment is received from the Department, or after the notice period under AS 36.25.020(b) expires, whichever is later;
 - (7) A clause is included requiring the Contractor to pay interest on retainage, according to AS 36.90.250 and AS 45.45.010(a);
 - (8) Other required items listed in Form 25D-042, including but not limited to Form 25D-55A, are included in the subcontracts;
 - (9) The subcontractors pay current prevailing rate of wages as per Subsection 70-04 and file signed and certified payrolls with the Engineer and DOLWD for all work performed on the project; and
 - (10) Upon receipt of a request for more information regarding subcontracts, the requested information is provided to the Department within 5 calendar days.
- b. The Contractor shall ensure that for all lower tier subcontracts (agreements between subcontractors and lower tier subcontractors):

- (1) The Department is furnished with one completed Contractor Self Certification, Form 25D-042, for each lower tier subcontract;
 - (2) The required prompt payment provisions of AS 36.90.210 are included in all lower tier subcontracts;
 - (3) A clause is included requiring the subcontractor to pay the lower tier subcontractor for satisfactory performance according to AS 36.90.210, and within eight (8) working days after receiving payment from which the subcontractor is to be paid;
 - (4) A clause is included requiring the subcontractor to pay the lower tier subcontractor interest, according to AS 45.45.010(a), for the period beginning the day after the required payment date and ending on the day payment of the amount due is made;
 - (5) A clause is included requiring the subcontractor to pay the lower tier subcontractor all retainage due under the subcontract, within eight (8) working days after final payment is received, or after the notice period under AS 36.25.020(b) expires, whichever is later;
 - (6) A clause is included requiring the subcontractor to pay the lower tier subcontractor interest on retainage, according to AS 36.90.250 and AS 45.45.010(a);
 - (7) Other required items listed in Form 25D-042, including but not limited to Form 25D-55A, are included in the lower tier subcontracts;
 - (8) The lower tier subcontractors pay current prevailing rate of wages as per Subsection 70-04 and file signed and certified payrolls with the Engineer and DOLWD for all work performed on the project; and
 - (9) Upon receipt of a request for more information regarding lower tier subcontracts, the requested information is provided to the Department within 5 calendar days.
- c. The following will be considered as subcontracting, unless performed by the Contractor:
- (1) Roadside Production. Roadside production of crushed stone, gravel, and other materials with portable or semi-portable crushing, screening, or washing plants set up or reopened in the vicinity of the project to supply materials for the project, including borrow pits used exclusively or nearly exclusively for the project.
 - (2) Temporary Plants. Production of aggregate mix, concrete mix, asphalt mix, other materials, or fabricated items from temporary batching plants, temporary mixing plants, or temporary factories that are set up or reopened in the vicinity of the project to supply materials exclusively or nearly exclusively for the project.
 - (3) Hauling. Hauling from the project to roadside production, temporary plants, or commercial plants, from roadside production or temporary plants to the project, from roadside production or temporary plants to commercial plants, and all other hauling not specifically excluded in this subsection.
 - (4) Other Contractors. All other contractors working on the project site under contract with the Contractor are considered subcontractors unless specifically excluded in this subsection.
- d. The following will not be considered as subcontracting, but the Contractor shall comply with the prompt payment provisions of AS 36.90:
- (1) Commercial Plants. The purchase of sand, gravel, crushed stone, crushed slag, batched concrete aggregates, ready-mixed concrete, asphalt paving mix, and any other material or fabrication produced at and furnished from established and recognized commercial plants that sell to both public and private purchasers.

Notwithstanding the Department's definitions of contracting and subcontracting, the Contractor shall be responsible for determining and complying with all federal and state laws and regulations regarding contracting, subcontracting, and payment of wages. The Contractor shall promptly pay any fines or penalties assessed for violations of those laws and regulations, and shall promptly comply with the directives of any government agency having jurisdiction over those matters.

80-02 NOTICE TO PROCEED. The Department will issue a Notice to Proceed authorizing construction to begin and indicating the date when Contract time will begin. The Contractor shall not begin construction before the effective date of the Notice to Proceed. The Notice to Proceed may include limits or restrictions on allowable activities. The Department will, in its sole discretion, refuse to pay for construction begun before the effective date of the Notice to Proceed. The Contractor shall notify the Engineer at least 48 hours before construction begins at the project site.

80-03 PROSECUTION AND PROGRESS. The Contractor shall meet with the Engineer at the regional construction office for a preconstruction conference before beginning construction. The Engineer will schedule the Preconstruction Conference no less than five days after the following have been received:

- a. A progress schedule, in a format acceptable to the Engineer, showing the order in which the Contractor proposes to carry out the work and the contemplated dates on which the Contractor and the subcontractors will start and finish each of the salient features of the work, including any scheduled periods of shutdown. The schedule shall indicate the anticipated hours of operation and any anticipated periods of multiple-shift work.
- b. A list showing anticipated dates for procurement of materials and equipment, ordering of articles of special manufacture, furnishing of plans, drawings and other data required under Subsections 50-02 and 60-08, and for other events such as inspection of structural steel fabrication
- c. A list showing all subcontractors and material suppliers
- d. A Storm Water Pollution Prevention Plan, a Hazardous Material Control Plan, and a Spill Prevention Control and Countermeasure Plan, with the line of authority and designated field representatives, as required under Item P-641 (see submittal deadlines under P-641-1.3)
- e. A letter designating the Contractor's Project Superintendent, defining that person's responsibility and authority, and providing a specimen signature
- f. A letter designating an Equal Employment Opportunity Officer and a Disadvantaged Business Enterprise Officer, and designating those person's responsibilities and authority
- g. A Quality Control Program, as required under Subsection 60-03 and Section 100
- h. An approved Safety Plan Compliance Document (SPCD), as required under Subsection 80-04
- i. A Traffic Control Plan, as required under Subsection 70-09 and Item G-710
- j. A Utility Repair Plan, as required under Subsection 50-06.e.

Provide suitable proof of filing and subsequent approval of a completed FAA Form 7460-1 Notice of Proposed Construction or Alteration, at least 45 days before the start date of work occurring on the project. Coordinate with the RASSO and Engineer when filing Form 7460-1. The Contractor is encouraged to file the form electronically. The FAA 7460-1 form and the electronic submittal instructions may be found at: <https://oeaaa.faa.gov/oeaaa/external/portal.jsp>

The Contractor shall provide adequate materials, labor and equipment to ensure the completion of the project according to the Plans and Specifications. The work shall be performed as vigorously and as continuously as weather conditions or other interferences may permit. The Contractor shall take into consideration and make due allowances at the Contractor's expense for foreseeable delays and interruptions to the work such as unfavorable weather, frozen ground, equipment breakdowns, shipping

delays, quantity overruns, utility work, permit restrictions, and other foreseeable delays and interruptions. The Contractor shall identify these allowances on the progress schedule.

The Contractor shall adjust forces, equipment and work schedules as necessary to ensure completion of the work within the Contract time, and shall notify the Engineer at least 24 hours before resuming suspended operations. Upon a substantial change to the work schedule or when directed by the Engineer, the Contractor shall submit a revised progress schedule in the form required, including a written explanation for each revision made in the schedule or methods of operation.

The Engineer's review or approval of the documents, plans, and schedules provided by the Contractor under this section shall not change the Contract requirements, release the Contractor of the responsibility for successful completion of the work or relieve the Contractor of the duty to comply with applicable laws. The Engineer's review or approval of schedules shall not indicate agreement with any assertions of delay or claims by the Contractor.

It is the Contractor's responsibility to prepare and submit documents that satisfy all applicable contract requirements. By reviewing and approving the Contractor's documents, the Department does not warrant that following the Contractor's documents will result in successful performance of the work. The Department's failure to discover defects in the Contractor's documents, the assumptions upon which they are based or conditions that prevent the Contractor from performing the work as indicated in the documents will not entitle the Contractor to additional compensation or time. If the Contractor becomes aware of any act or occurrence that may form the basis of a claim for additional compensation or an extension of time, it must specifically advise the Engineer of these conditions according to Subsection 50-17.

80-04 LIMITATION OF OPERATIONS. The Contractor shall not open up work to the detriment of work already started. The Contractor shall minimize interference with traffic within the project. The Contractor shall not stop or otherwise impede traffic outside the project limits without the Engineer's prior written permission. The Engineer may require the Contractor to finish a section of work in progress before starting additional sections if the Engineer determines it is necessary for the convenience of the public or the Department.

The Contractor shall control its operations and the operations of its subcontractors and all suppliers, so as to provide for the least inconvenience to traffic and the free and unobstructed movement of aircraft in the Air Operations Areas of the airport, except as specifically provided in this Contract. Under all circumstances, safety shall be the most important consideration.

a. **Environmental Limitations.** The Contractor shall comply with all environmental commitments, permit stipulations, and construction limitations, in the Contract permits and specifications. These may include time periods in which certain construction activities are not allowed. The Contractor shall avoid disturbing wetlands unless permitted to do so. The Contractor shall avoid disturbing threatened and endangered species, historic sites, and hazardous materials sites.

b. **Construction Safety.**

(1) **Construction Safety and Phasing Plan (CSPP).** This document is included within the contract documents when attached as an appendix to this document. The CSPP specifies minimum requirements for operational safety during construction activities.

(2) **Safety Plan Compliance Document (SPCD).** When the contract documents include a CSPP, the Contractor shall submit to the Engineer a SPCD in accordance with the provisions set forth within the current version of AC 150/5370-2, *Operational Safety on Airports During Construction*. The SPCD shall include a general statement that the Contractor has read and will abide by the CSPP and shall include the Contractor's name, the title of the project CSPP, the approval date of the CSPP, and a reference to any supplemental information (example statement: "I, Name of Contractor, have read the Title of the Project CSPP, approved on Date, and will abide by it as written and with the following additions as noted."). The supplemental information in the SPCD should be written to match the format of the CSPP indicating each

subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not merely duplicate information in the CSPP. No deviations or modifications may be made to the approved CSPP or SPCD unless approved in writing by the Engineer.

The Contractor shall implement all necessary CSPP and SPCD measures prior to commencement of any work activity. The Contractor shall conduct daily checks of its workers, equipment, and construction methods to assure compliance with the CSPP and SPCD measures. The Contractor shall document the checks in writing and sign them. Documented checks shall be available for inspection by the Engineer.

The Contractor is responsible for the conduct of all subcontractors and suppliers it employs on the project. The Contractor shall assure that all subcontractors and suppliers are made aware of the requirements of the CSPP and SPCD, and that the subcontractors and suppliers implement and maintain all necessary safety measures.

The CSPP and SPCD will indicate areas within airport property boundaries that may be used for material stockpile, and will indicate the maximum height of stockpile allowed. The Contractor shall obtain prior approval from the Engineer before using other areas within airport property. The Engineer may limit stockpile heights or equipment heights in any area, either inside or outside of airport property, based on requirements in the ACs or other factors necessary to ensure the free and unobstructed operation of aircraft.

- c. **Security Plan.** When required by the Contract, the Contractor shall control its operations and the operations of its subcontractors and all suppliers so as to provide for the security of the Airport. The Contractor's operations shall be conducted according to the Security Plan and the provisions set forth within the current version of DOT/FAA/AR-00/52, *Recommended Security Guidelines for Airport Planning and Construction*. No deviations or modifications may be made to the approved Security Plan unless approved in writing by the Engineer.
- d. **Notification.** When the work requires the Contractor to conduct its operations within an Air Operations Area of the airport, the work shall be coordinated in accordance with the requirements of the CSPP. The Contractor shall begin coordination through the Engineer with the Airport Manager, FAA, other project stakeholders, at least 45 days before working in the Air Operations Area. When written correspondence is approved by the Engineer the Contractor shall copy to the Engineer all correspondence with the Airport Manager, the FAA, and other project stakeholders.

The Contractor shall provide information and coordinate with the Airport Manager, through the Engineer, for all required NOTAMs. Begin coordination at least 14 days prior to the date that the NOTAM needs to be issued by. Provide final information on a form provided by the Department, and submit the form through the Engineer to the Airport Manager at least 72 hours prior to: closure or change in the Air Operations Area; or startup, resumption, cessation of, or change in construction activity that affects aircraft operations.

The Contractor shall not begin work for any Phase that requires issuance of a NOTAM until all of the following have been met:

- (1) Coordination required by the CSPP and the SPCD has been accomplished;
- (2) The NOTAM has been authorized by Airport Manager and its issuance by the FAA has been confirmed;
- (3) The necessary temporary marking and associated lighting are accepted;
- (4) The necessary NAVAIDS have been modified as specified in the CSPP, SPCD, and Subsection 70-09; and

(5) The Engineer has authorized the Contractor to begin work.

Coordinate all questions to the FAA through the Engineer.

Contact the FAA Systems Operations Control Center at least 45 days prior to:

- (1) Closing a runway
- (2) Re-opening a closed runway
- (3) Interrupting service or removing visual or navigational aids
- (4) Displacing a runway threshold

e. Work Procedures and Communications within the Airport Operations Area.

Vehicles, equipment and materials shall never be parked or left standing on runways, runways safety areas, and taxiways open to aircraft. In Air Operations Areas, all vehicles shall be equipped with a functional flashing amber hazard light and all obstructions except stakes or hazard markers shall be removed during non-working hours. The Contractor shall remove construction equipment from and otherwise clear the runway and the designated Runway Safety Areas for operation of regularly scheduled airline flights. The Contractor shall remain continuously informed regarding flight schedule times.

When the contract work requires the Contractor to work within an Air Operations Area of the airport on an intermittent basis (intermittent opening and closing of all or a portion of the Air Operations Area), the Contractor shall maintain constant communications as hereinafter specified, immediately obey all instructions to vacate the Air Operations Area, and immediately obey all instructions to resume work in such Air Operations Area. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the Air Operations Area, with no damages available from the Department, until the satisfactory conditions are provided. The Contractor shall establish and maintain communication or monitor communications with the appropriate radio facility as prescribed in the following:

- (1) **Airports With Control Towers:** At those airports with control towers, the Contractor shall comply with the instructions of the airport controller. The Contractor shall continuously monitor 2-way radio communication on the appropriate ground control frequency. The Contractor shall furnish a liaison radio operator and 2-way radio communication with each work party located within the Air Operations Area
- (2) **Airports Without Control Towers:** At those airports without control towers, the Contractor shall comply with the instructions of a FSS Employee, a pilot, or a pilot's representative. The Contractor shall continuously monitor by 2-way radio, the CTAF published in the current *FAA Chart Supplement Alaska*. The Contractor shall furnish a liaison radio operator and 2-way radio communication with each work party located within the Air Operations Area.

80-05 CHARACTER OF WORKERS, METHODS, AND EQUIPMENT. The Contractor shall employ sufficient labor and equipment to complete the work required under the Contract and to complete it on time.

The Contractor shall ensure that all workers on the project have the skills and experience necessary to properly perform their assigned work. Workers engaged in special work or skilled work shall have sufficient experience in that work and in the operation of the equipment required to properly perform that work.

The Contractor shall comply with any written order by the Engineer to remove workers, who, in the opinion of the Engineer, violate operational regulations, violate CSPP requirements, violate SPCD requirements, perform the work in an unskilled manner, create risk of imminent harm for the traveling public, who are intemperate or disorderly, or who fail to perform the work in accordance with the Contract and any and all

applicable federal, state, and local laws, rules, regulations, and ordinances. The Contractor shall allow removed workers to return to the project only with the Engineer's written permission. The Engineer may suspend the work if the Contractor fails to furnish suitable and sufficient personnel necessary to perform the work, or fails to remove any worker at the Engineer's order.

The Contractor shall not use prisoner labor on the project.

The Contractor shall use equipment of the appropriate size and mechanical condition to produce the specified quality and quantity of work by the means specified in the Contract, if any, and shall ensure that the equipment does not damage roadways or property.

The Contractor shall ensure all equipment, materials, and articles incorporated into the work are new and of the specified quality, unless the Contract specifically permits otherwise.

The Contractor shall provide the Engineer with a list of all powered equipment that will be used on the project, showing the make, model, year, capacity, horsepower, and related information. The Contractor shall update this list when equipment is added or removed from the work site, but need not update more frequently than weekly.

When the methods and equipment to be used by the Contractor are not prescribed by the contract, the Contractor is free to use any method, means or equipment that is satisfactory to produce the specified work in conformity with the Contract, except as provided above. At the request of the Engineer, the Contractor shall demonstrate that the method, means and equipment chosen will produce the work specified in the Contract in the time allowed under the Contract. The Contractor shall bear all costs and impacts associated with any means, methods and equipment chosen by the Contractor. No suggestion, statement or observation from the Engineer or other Department representatives shall alter this responsibility.

If the Contract specifies a particular method, means or type of equipment for performance of the work, the Contractor must use that method, means or equipment unless the Contractor first requests, in writing, permission to alter the Contract requirement and receives prior written approval from the Engineer. The written request shall include a full description of the methods and equipment proposed and of the reasons for desiring to make the change. If approval is given, it will be on the condition that the Contractor will be fully responsible for producing work in conformity with contract requirements. If, after trial use of the substituted methods or equipment, the Engineer determines that the work produced does not meet contract requirements, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining work with the specified methods and equipment. The Contractor shall remove any deficient work and replace it with work of specified quality, or take such other corrective action as the Engineer may direct. No change will be made in basis of payment for the contract items involved, nor in contract time, as a result of authorizing a change in methods or equipment under this subsection, except as specifically provided under Subsection 40-08.

80-06 CONTRACT TIME, EXTENSION OF CONTRACT TIME AND SUSPENSION OF WORK. Contract time will be specified in Calendar Days, by Completion Date, or both.

- a. **Calendar Days.** When the contract time is specified on a calendar days basis, all work under the Contract shall be completed within the number of calendar days specified. If no starting day is specified in the Contract, the count of Contract time begins on the day following receipt of the Notice to Proceed by the Contractor.

Calendar days shall continue to be counted against Contract time until and including the date of project completion. Calendar days shall not be counted during the period from November 1 through April 30, except for days that the Contractor is working on the project site.

- b. **Completion Date.** When the contract time is specified on a completion date basis, all work under the Contract shall be completed by the specified completion date.

- c. Reasons for Suspension of Work and Extension of Contract Time.** The Department may order a suspension of work for any reason listed in this subparagraph c., items (1) through (16).

The Department shall not pay additional compensation, but may extend Contract time only, if there are delays in the completion of controlling items of work from unforeseeable causes that are beyond the Contractor's control and are not the result of the Contractor's fault or negligence, including:

- (1) Acts of God;
- (2) Acts of the public enemy;
- (3) Fires;
- (4) Floods;
- (5) Epidemics;
- (6) Quarantine restrictions;
- (7) Strikes;
- (8) Freight embargoes;
- (9) Unusually severe weather;
- (10) According to Subsection 50-06.d.(4), delays by utility owners beyond completion dates specified in the Special Provisions for relocating or adjusting utilities and related facilities; or
- (11) Delays of subcontractors, suppliers and fabricators from unforeseeable causes beyond the control of the subcontractors, suppliers or fabricators and that are not the fault of the subcontractors, suppliers or fabricators, including those causes listed in this Subparagraph c, Items (1) through (10).

No additional Contract time or additional compensation will be allowed due to delays caused by or suspensions ordered due to:

- (12) Failure to correct conditions that create risk of imminent harm for the traveling public, violations of the Contract or any applicable federal, state, and local laws, rules, regulations, and ordinances;
- (13) Adverse weather that is not unusually severe;
- (14) Failure to carry out Contract provisions;
- (15) Failure to carry out orders given by the Engineer; or
- (16) Failure to timely obtain materials, equipment, or services.

The Contractor shall notify the Engineer as soon as the Contractor becomes aware of any act or occurrence that may form the basis of a request for a time extension under this section. The Contractor shall submit a request for a time extension to the Engineer within 10 days of the act or occurrence, and if an agreement is not reached, the Contractor may submit a Claim under Subsection 50-17.

The time allowed in the Contract, as awarded, is based on performing the original estimated quantities of work set out in the bid schedule. An assertion that insufficient time was originally specified shall not constitute a valid reason for extension of contract time.

If satisfactory fulfillment of the Contract requires extra work, the Department may extend Contract time according to Subsection 40-02.

- d. Suspension of Work.** The Engineer will suspend work on the project, in whole or in part, for such periods and for such reasons as the Engineer determines to be reasonable, necessary, in the public interest, or for the convenience of the Department.
- (1) The Engineer will issue a written order to suspend, delay, or interrupt all or any part of the work. The Contractor shall not be compensated for the suspension, delay, or interruption if it is imposed for a reasonable time under the circumstances.
 - (2) Unless another Contract section specifically provides otherwise, the Contractor will be compensated by equitable adjustment for a suspension, delay, or interruption of the work only if:
 - (a) The period of suspension, delay, or interruption is for an unreasonable time under the circumstances and another Contract section allows compensation in the event of a suspension, delay, or interruption of the work under the circumstances that actually caused the suspension, delay, or interruption; or
 - (b) The delay, suspension, or interruption results from the Department's failure to fulfill a contractual obligation to the Contractor within the time period specified in the Contract or, if no time period is specified, within a reasonable time.
 - (3) No equitable adjustment will be made under this subsection for any suspension, delay, or interruption of the work if the Contractor's performance would have been suspended, delayed, or interrupted by any other cause for which:
 - (a) The Department is not responsible under the Contract, including the Contractor's fault or negligence; or
 - (b) An equitable adjustment is either provided for or excluded under any other section of this Contract.
 - (4) Claims for equitable adjustments under this section shall be filed under Subsection 50-17 except that:
 - (a) The Contractor must give written notice of intent to claim no later than 20 days after the event giving rise to the delay, suspension, or interruption;
 - (b) The claim may not include any costs incurred more than 20 days before the Contractor files the Contractor's written notice of intent to claim;
 - (c) The contractor must submit a written request for adjustment within 7 calendar days of receipt of the notice to resume work;
 - (d) No profit will be allowed on an increase in cost necessarily caused by the suspension, delay, or interruption.

80-07 FAILURE TO COMPLETE ON TIME. For each calendar day that the work is not substantially complete after the expiration of the Contract time or the completion date has passed, the Engineer shall deduct the full daily charge corresponding to the original Contract amount shown in Table 80-1 from progress payments.

For each calendar day that the work is substantially complete but the project is not complete, after the expiration of the Contract time or the completion date has passed, the Engineer shall deduct 20 percent of the daily charge corresponding to the original Contract amount shown in Table 80-1 from progress payments.

If no money is due the Contractor, the Department may recover these sums from the Contractor, from the Surety, or from both. These are liquidated damages and not penalties. These charges shall reimburse the Department for its additional administrative expenses incurred due to the Contractor's failure to complete the work within the time specified.

**Table 80-1
DAILY CHARGE FOR LIQUIDATED DAMAGES
FOR EACH CALENDAR DAY OF DELAY**

Original Contract Amount		Daily Charge
From More Than	To and Including	
\$ 0	500,000	\$1,400
500,000	1,000,000	1,700
1,000,000	5,000,000	2,600
5,000,000	10,000,000	3,800
10,000,000	25,000,000	4,500
25,000,000	-----	6,600

Permitting the Contractor to continue work after the durations, dates, and times specified in the Contract have elapsed, or after the Contract time has elapsed or the completion date has passed does not waive the Department's rights to collect liquidated damages under this section.

80-08 DEFAULT OF CONTRACT. The Contracting Officer will give a written Notice of Default to the Contractor and the Surety if the Contractor:

- a. Fails to begin work under the Contract within the time specified;
- b. Fails to perform the work with sufficient workers, equipment, or materials to ensure the prompt completion of the work;
- c. Performs the work unsuitably or neglects or refuses to remove materials or to replace rejected work;
- d. Discontinues the prosecution of the work;
- e. Fails to resume work that has been discontinued within a reasonable time after notice to do so;
- f. Becomes insolvent except that if the Contractor declares bankruptcy, termination shall be according to the Federal Bankruptcy Code. In the event that the Contractor declares bankruptcy, the Contractor agrees that the Contract will be assumed by the Surety in a timely manner so as to complete the Contract by the date specified in the Contract;
- g. Allows any final judgment to stand against the Contractor unsatisfied for a period of 60 days;
- h. Makes an assignment for the benefit of creditors, without the consent of the Engineer;
- i. Fails to comply with applicable minimum wage or civil rights requirements;
- j. Is a party to fraud, deceit, misrepresentation, or malfeasance in connection with the Contract; or
- k. Fails to perform the work in an acceptable manner for any other cause whatsoever.

The written Notice of Default will include a notice to cure and will establish a date by which the cure must be completed. The Contracting Officer may allow more time to cure than originally stated in the Notice of Default if the Contracting Officer deems it to be in the best interests of the Department. Failure to cure the delay, neglect, or default within the time specified in the Contracting Officer's Notice of Default authorizes the Department to terminate the contract. The Department will provide the Contractor and the Contractor's Surety with a written Notice of Termination.

After the Notice of Termination is issued, the Department may take over the work without further notice; may complete it by itself, by contract or otherwise; and may take possession of and use materials, appliances, equipment, or plant on the work site necessary for completing the work.

The Department may transfer the obligation to perform the work from the Contractor to the Surety. In that event, the Surety shall submit its plan for completion of the work, including any contracts or agreements with third parties for completion, to the Department for approval before beginning work. The Surety must follow the Contract requirements for approval of subcontracts, except that the limitation on percent of work subcontracted will not apply. On receipt of the transfer notice, the Surety shall take possession of all materials, tools, equipment, and appliances at the work site, employ an appropriate work force, and complete the Contract work as specified. The Contract specifications and requirements shall remain in effect, except that the Department will make subsequent Contract payments directly to the Surety. The Contractor forfeits any right to claim for the work and is not entitled to receive any further balance of the amount to be paid under the Contract.

The Contractor and the Contractor's Surety are jointly and severally liable for any damage to the Department resulting from the Contractor's delay, neglect, or default, whether or not the Department terminates the Contractor's right to prosecute the work. The Department's damages include any increased costs incurred by the Department in completing the work or paying for the work to be completed. The Department's rights and remedies are in addition to any other rights and remedies provided by law or under the Contract.

If, after notice of termination of the Contractor's right to proceed under this clause, it is determined that the Contractor was not in default, or that the default was excusable, the rights and obligations of the parties will be determined under Subsection 80-09, Termination for Convenience.

80-09 TERMINATION FOR CONVENIENCE.

a. Notice. The Contracting Officer may terminate the Contract in whole or in part due to:

- (1) Executive Orders of the President of the United States or the Governor of the State of Alaska with respect to the prosecution of war or the interest of national defense, or any disaster declaration.
- (2) Restraining orders or injunctions by a court of competent jurisdiction affecting prosecution of the work based on acts or omissions of persons or agencies other than the Contractor.
- (3) Any reason determined by the Contracting Officer to be in the best interest of the Department.

The Contracting Officer will issue a written Notice of Termination to the Contractor. The Notice of Termination shall state the extent to which performance of work under the Contract is terminated, the effective date of the termination, and for which of the above-listed reasons the Contract is terminated.

b. Required Actions. Unless otherwise directed by the Contracting Officer, upon receipt of a Notice of Termination the Contractor shall immediately:

- (1) Stop work as directed in the Notice.
- (2) Place no further orders or subcontracts for materials, services, or facilities except as approved to complete work not terminated.
- (3) Terminate all orders and subcontracts for the terminated work.
- (4) Accomplish either (a) or (b) below as directed by the Contracting Officer:

- (a) Assign to the Department all right, title and interest in any terminated orders or subcontracts. The Contracting Officer will settle all claims on the terminated orders or subcontracts.
 - (b) Settle any outstanding liabilities and claims arising from termination of orders and subcontracts. Settlements must be limited to costs allowed under this section.
- (5) Submit to the Contracting Officer a list, certified as to quantity and quality, of all materials acquired or produced for incorporation into the project and that are properly allocable to the terminated portion of the project, exclusive of items disposed of under Subsection 80-09.b.(6), below.
- (6) Dispose of materials in the Contractor's possession or control that were acquired or produced but not incorporated into the project as of the termination date as directed by the Contracting Officer under either (a) or (b) below:
- (a) Transfer title and deliver the materials to the Department. The Department will pay for the materials at the actual cost delivered to the project or storage site, including transportation charges, to which cost 15% will be added.
 - (b) Sell the materials. Credit will not have to be extended to prospective purchasers.

The Contractor may acquire the materials if the Contracting Officer approves the sale price and the Contractor meets any other conditions prescribed by the Contracting Officer.

At the sole discretion of the Contracting Officer, the proceeds of any sale, transfer, or disposition of materials may be:

- (c) Applied to reduce any payments to be made by the Department under the Contract;
 - (d) Credited to the cost of the work; or
 - (e) Paid in any other manner as directed.
- (7) Deliver to the Department completed or partially completed plans, drawings, information, and other property required to be furnished under the Contract.
- (8) Take all necessary actions and comply with all directives to protect contract-related property in which the Department has or may acquire an interest.
- (9) Complete work not terminated.

The Contractor shall proceed immediately with performance of the above obligations notwithstanding any delay in determining or adjusting the amount of any item or reimbursable cost under this clause.

c. Claim. The Contractor shall submit any termination claim to the Contracting Officer within 90 days after the effective date of termination, unless the date for submitting a claim is extended in writing by the Contracting Officer.

- (1) Without duplication of any amount paid for under Subsection 80-09.b., the claim may be for the total of:
 - (a) Costs incurred in performing the terminated work from the date of Contract award to the effective date of the termination subject to the provisions of 80-09.c.(2) regarding reimbursement of equipment costs and 80-09.c.(3) regarding unallowable items.

- (2) The remainder of the total allowable claim amount due reduced by multiplying the remainder by the ratio of (a) the total contract price to (b) the remainder plus the estimated cost to complete the entire Contract; minus
- (3) All disposals and other credits, all advance and progress payments and all other amounts previously paid under the Contract.
- e. **Deductions.** In arriving at the amount due under this subsection, the Department will deduct:
- (1) All previous payments made before termination;
- (2) Any claim which the Department may have against the Contractor;
- (3) The proceeds of the sale or transfer of any materials, supplies, or other items acquired for the terminated work and not otherwise recovered by or credited to the Department;
- (4) All partial payments made under this section; and
- (5) Any adjustment for loss determined under Subsection 80-09.d.
- f. **Agreed Settlement.** The Contractor shall make every effort to arrive at a claim settlement with the Contracting Officer that is fair to both parties, that reflects the reasonable and allocable incurred costs allowable under Subsection 80-09.c, that includes a profit under Subsection 80-09.c.(1)(d) or, where appropriate, a loss adjustment under Subsection 80-09.d., and that takes into account the Contractor's reasonable business judgment in performing the work.
- The total settlement, whether determined under this Subsection 80-09.f. or under Subsection 80-09.g., exclusive of the costs listed in Subsection 80-09.c.(1)(c), may not exceed the total contract price as reduced by previous payments made and the contract price of work not terminated.
- If an agreement is reached in whole or in part, the Department will amend the contract and will pay the agreed amount.
- g. **Determined Settlement.** If the Contractor fails to submit a termination claim within the time allowed, or if an agreement is not reached on the amount due, the Contracting Officer may determine in a Contracting Officer's Decision, the amount due under Subsection 80-09 on the basis of information available to the Department.
- h. **Right of Appeal.** The Contractor may appeal a Contracting Officer's Decision within the time and in the manner specified in Subsection 50-17.
- i. **Partial Payments.** In the sole discretion of the Contracting Officer, the Department may make partial payments against costs incurred by the Contractor in connection with the terminated portion of the Contract. The sum of these partial payments will not exceed the Contracting Officer's estimate of the total amount that will be due as a result of the termination. The estimate will be based on available information. The Contracting Officer may adjust the estimate as additional information becomes available. If the Contracting Officer orders an audit of the Contractor's financial or project records, the Contracting Officer may decline to make partial payments until the audit is completed.
- j. **No Waiver of Rights.** The termination of work by the Department does not affect or extinguish any of the rights of the Department against the Contractor or the Contractor's Surety then existing or which may thereafter accrue. Any retention or payment of monies by the Department due under the terms of the Contract will not release the Contractor or the Contractor's Surety from the contractual obligations or warranties made under Subsection 70-19 or elsewhere in the Contract.
- k. **Retaining Records.** The Contractor shall unless otherwise provided for in the Contract or by applicable statute, keep all books, records, documents, and other evidence bearing on the

Contractor's cost and expenses under the Contract and relating to the work terminated for a period of 3 years after final settlement under this Contract. Records must be made available to the Department at the Contractor's office and at all reasonable times.

- I. Definitions.** In this Subsection 80-09, the term "cost" and the term "expense" mean a monetary amount in U.S. Dollars actually incurred by the Contractor, actually reflected in the Contractor's contemporaneously maintained accounting or other financial records and supported by original source documentation.

- m. Cost Principles.** The Department may use the federal cost principles at 48 CFR §§ 31.201-1 to 31.205-52 (or succeeding cost principles for fixed price contracts) as guidelines in determining allowable costs under this subsection to the extent they are applicable to airport construction contracts and consistent with the specifications of this Contract. The provisions of this contract control where they are more restrictive than, or inconsistent with, these federal cost principles.

ITEM D-701 PIPE FOR STORM DRAINS AND CULVERTS

DESCRIPTION

701-1.1 This item shall consist of the construction of pipe culverts and storm drains according to these Specifications and in reasonably close conformity with the lines and grades shown on the Plans.

MATERIALS

701-2.1 Materials shall meet the requirements shown on the Plans and specified below.

701-2.2 PIPE. The pipe shall be of the type called for on the Plans and shall be according to the following appropriate requirements.

Metallic Coated Corrugated Steel Pipe (Type I, IR or II)	AASHTO M 36
Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains	ASTM A760
Galvanized Steel Corrugated Structural Plates and Fasteners for Pipe, Pipe-Arches, and Arches	ASTM A761
Polymer Precoated Corrugated Steel Pipe for Sewers and Drains Post-Coated and Lined (Bituminous or Concrete)	ASTM A762
Corrugated Steel Sewer and Drainage Pipe	ASTM A849
Corrugated Aluminum Alloy Culvert Pipe	ASTM B745
Non-Reinforced Concrete Pipe	ASTM C14
Reinforced Concrete Pipe	ASTM C76
Reinforced Concrete D-Load Pipe	ASTM C655
Reinforced Concrete Arch Pipe	ASTM C506
Reinforced Concrete Elliptical Pipe	ASTM C507
Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers	ASTM C1433
Corrugated Polyethylene (PE) Pipe and Fittings	ASTM F667
Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter	ASTM F714
Poly (Vinyl Chloride) Ribbed Drain Pipe & Fittings Based on Controlled Inside Diameter	ASTM F794
Polyethylene (PE) Large Diameter profile Wall Sewer and Drain Pipe	ASTM F894
Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings	ASTM F949
Steel Reinforced Polyethylene (PE) Corrugated Pipe	ASTM F2435
Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage	ASTM F2562
Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe	ASTM F2736
Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications	ASTM F2764
Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications.	ASTM F2881
Bituminous-Coated Corrugated Metal Pipe and Pipe Arches	AASHTO M 190
Bituminous-Coated Corrugated Aluminum Alloy Culvert Pipe	AASHTO M 190 and M 196
Bituminous-Coated Structural Plate Pipe, Pipe Arch, and Arches	AASHTO M 167 and M 243
Aluminum Alloy Structural Plate for Pipe, Pipe Arch, and Arches	AASHTO M 219
Polyvinyl Chloride (PVC) Pipe	ASTM D3034
Corrugated Polyethylene Drainage Tubing	AASHTO M 252
Corrugated Polyethylene Pipe, 300 mm to 1500 mm Diameter	AASHTO M 294

701-2.3 CONCRETE. Concrete for pipe cradles shall have a minimum compressive strength of 2,000 pounds per square inch (psi) at 28 days and conform to the requirements of AASHTO M 157.

701-2.4 RUBBER GASKETS. Rubber gaskets for rigid pipe shall conform to the requirements of ASTM C443. Rubber gaskets for PVC pipe and polyethylene pipe shall conform to the requirements of ASTM F477. Rubber gaskets for zinc-coated steel pipe and pre-coated galvanized pipe shall conform to the requirements of ASTM D1056, for the "RE" closed cell grades. Rubber gaskets for steel reinforced thermoplastic ribbed pipe shall conform to the requirements of ASTM F477.

701-2.5 JOINT MORTAR. Pipe joint mortar shall consist of one part by volume of portland cement and two parts sand. The portland cement shall conform to the requirements of AASHTO M 85, Type I. The sand shall conform to the requirements of AASHTO M 45.

701-2.6 JOINT FILLERS. Poured filler for joints shall conform to the requirements of AASHTO M 324.

701-2.7 PLASTIC GASKETS. Plastic gaskets shall conform to the requirements of AASHTO M 198 (Type B).

701-2.8. CONTROLLED LOW-STRENGTH MATERIAL (CLSM). Controlled low-strength material shall conform to the requirements of Item P-153. When CLSM is used all joints shall have gaskets.

701-2.9 CULVERT MARKER POSTS. Provide posts made of durable glass fiber and resin reinforced material flexible to -40°F, resistant to impact and ultraviolet light. "T" in cross section, 3.75 inch wide x 72 inches long, and color blue. Provide Carsonite CUM-375 utility marker or approved equal.

701-2.10 CLASS B BEDDING. Use one of the following materials:

- a. Suitable material as defined in specification subsection P-152-2.3, except that 100% of the material will pass a 1 inch sieve.
- b. P-299 Aggregate Surface Course (when included in this contract).
- c. P-209 Crushed Aggregate Base Course (when included in this contract).

701-2.11 END SECTIONS. End sections for metal pipe must be of the same material as the pipe.

CONSTRUCTION METHODS

701-3.1 EXCAVATION. The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but it shall not be less than the external diameter of the pipe plus 18 inches on each side. The trench walls shall be approximately vertical.

Where rock, hardpan, or other unyielding material is encountered, the Contractor shall remove it from below the foundation grade for a depth of at least 8 inches or 1/2 inch for each foot of fill over the top of the pipe (whichever is greater) but for no more than 75% of the nominal diameter of the pipe. The width of the excavation shall be at least 1 foot greater than the horizontal outside diameter of the pipe. The excavation below grade shall be backfilled with selected fine compressible material, such as silty clay or loam, and lightly compacted in layers not over 6 inches in uncompacted depth to form a uniform but yielding foundation.

Where a firm foundation is not encountered at the grade established, due to soft, spongy, or other unstable soil, the unstable soil shall be removed and replaced with approved Class B bedding material for the full trench width. The Engineer shall determine the depth of removal necessary. The Class B bedding material shall be compacted to provide adequate support for the pipe.

The excavation for pipes that are placed in embankment fill shall not be made until the embankment has been completed to a height above the top of the pipe as shown on the Plans.

701-3.2 BEDDING. The pipe bedding shall conform to the class specified on the Plans. When no bedding class is specified or detailed on the Plans, the requirements for Class B bedding shall apply. Compact all bedding to 95% of the maximum density determined by ATM 207 or ATM 212.

- a. **Rigid Pipe.** Class A bedding shall consist of a continuous concrete cradle conforming to the plan details.

Class B bedding shall consist of a bed of granular material having a thickness of at least 6 inches below the bottom of the pipe and extending up around the pipe for a depth of not less than 30% of the pipe's vertical outside diameter. The layer of bedding material shall be shaped to fit the pipe for at least 10% of the pipe's vertical diameter and shall have recesses shaped to receive the bell of bell and spigot pipe.

Class C bedding shall consist of bedding the pipe in its natural foundation material to a depth of not less than 10% of the pipe's vertical diameter. The bed shall be shaped to fit the pipe and shall have recesses shaped to receive the bell of bell and spigot pipe.

- b. **Flexible Pipe.** For flexible pipe, the bed shall be roughly shaped to fit the pipe, and a bedding blanket of sand or fine granular material shall be provided as follows:

and	Pipe Corrugation Depth, in.	Minimum Bedding Depth, in.	c. PVC
	1/2	1	
	1	2	
	2	3	
	2-1/2	3-1/2	

Polyethylene Pipe. For PVC and polyethylene pipe, the bedding material shall consist of Class B bedding. The bedding shall have a thickness of at least 6 inches below the bottom of the pipe and extend up around the pipe for a depth of not less than 50% of the pipe's vertical outside diameter.

701-3.3 LAYING PIPE. The pipe laying shall begin at the lowest point of the trench and proceed upgrade. The lower segment of the pipe shall be in contact with the bedding throughout its full length. Bell or groove ends of rigid pipes and outside circumferential laps of flexible pipes shall be placed facing upgrade.

Paved or partially lined pipe shall be placed so that the longitudinal center line of the paved segment coincides with the flow line.

Elliptical and elliptically reinforced concrete pipes shall be placed with the manufacturer's reference lines designating the top of pipe within five degrees of a vertical plane through the longitudinal axis of the pipe.

701-3.4 JOINING PIPE. Joints shall be made with (1) portland cement mortar, (2) portland cement grout, (3) rubber gaskets, (4) plastic gaskets, or (5) coupling bands.

Mortar joints shall be made with an excess of mortar to form a continuous bead around the outside of the pipe and shall be finished smooth on the inside. Molds or runners shall be used for grouted joints in order to retain the poured grout. Rubber ring gaskets shall be installed to form a flexible watertight seal.

- a. **Concrete Pipe.** Concrete pipe may be either bell and spigot or tongue and groove. The method of joining pipe sections shall be such that the ends are fully entered and the inner surfaces are reasonably flush and even. Joints shall be thoroughly wetted before mortar or grout is applied.
- b. **Metal Pipe.** Metal pipe shall be firmly joined by form fitting bands conforming to the requirements of ASTM A760 for steel pipe and AASHTO M 36 for aluminum pipe.

- c. **PVC, Polypropylene, and Polyethylene Pipe.** Joints for PVC, polypropylene, and polyethylene pipe shall conform to the requirements of ASTM D3212 when water tight joints are required. Joints for PVC and polyethylene pipe shall conform to the requirements of AASHTO M 304 when soil tight joints are required. Fittings for polyethylene pipe shall conform to the requirements of AASHTO M 252 or M 294. Fittings for polypropylene pipe shall conform to the requirements of ASTM F2881, ASTM F2736, or ASTM F2764.

701-3.5 BACKFILLING. Pipes shall be inspected before any backfill is placed; any pipes found to be out of alignment, unduly settled, or damaged shall be removed and relaid or replaced at the Contractor's expense.

Use backfill that is suitable material as defined in subsection P-152-2.3 except that:

- a. 100% of the material placed within 1 foot of the pipe will pass a 3 inch sieve.
- b. If the pipe is placed in or under the structural section, construct the backfill according to the material and construction requirements of the specifications for the applicable lift of material (P-154, P-299, P-209).

When the top of the pipe is even with or below the top of the trench, the backfill shall be compacted in layers not exceeding 6 inches on both sides of the pipe and shall be brought up 1 foot above the top of the pipe or to natural ground level, whichever is greater. Care shall be exercised to thoroughly compact the backfill material under the haunches of the pipe without displacing the pipe. Material shall be brought up evenly on both sides of the pipe for the full length of the pipe.

When the top of the pipe is above the top of the trench, the backfill shall be compacted in layers not exceeding 6 inches and shall be brought up evenly on both sides of the pipe to 1 foot above the top of the pipe. The width of backfill on each side of the pipe for the portion above the top of the trench shall be equal to twice the pipe's diameter or 12 feet, whichever is less.

For PVC, polypropylene, and polyethylene pipe, the backfill shall be placed in two stages; first to the top of the pipe and then at least 12 inches over the top of the pipe. The backfill material shall meet the requirements of Subsection 701-3.2c.

All backfill shall be compacted to the density required under Item P-152.

It shall be the Contractor's responsibility to protect installed pipes and culverts from damage due to construction equipment operations. The Contractor shall be responsible for installation of any extra strutting or backfill required to protect pipes from the construction equipment.

701-3.6 CULVERT MARKER POSTS. Install culvert marker posts at each culvert inlet and outlet. Drive posts to 18 inches minimum embedment.

METHOD OF MEASUREMENT

701-4.1 PIPE. The length of pipe will be measured in linear feet of pipe in place, completed, and approved. It will be measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. The several classes, types and size will be measured separately. All fittings and end sections will be included in the length of the pipe being measured. All trench excavation and backfill associated with pipe installation is subsidiary.

701-4.2 CONCRETE. The volume of concrete for pipe cradles to be paid for will be the number of cubic yards of concrete which is completed in place and accepted.

701-4.3 ROCK. The volume of rock to be paid for will be the number of cubic yards of rock excavated. No payment will be made for the cushion material placed for the bed of the pipe.

701-4.4 CULVERT MARKER POSTS. Culvert marker posts will not be measured for payment.

BASIS OF PAYMENT

701-5.1 Payment will be made at the contract unit price per linear foot for each kind of pipe of the type and size designated; at the contract unit price per cubic yard of concrete for pipe cradles; and at the contract unit price per cubic yard for rock excavation. Culvert marker posts will not be paid for directly, but will be subsidiary to pipe items.

Payment will be made under:

Item D701._____	_____ Pipe, _____-inch – per linear foot
Item D701.070.0000	Concrete for Pipe Cradles – per cubic yard
Item D701.080.0000	Rock Excavation – per cubic yard

REFERENCES

AASHTO M 36	Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains
AASHTO M 45	Aggregate for Masonry Mortar
AASHTO M 85	Portland Cement
AASHTO M 157	Ready-Mixed Concrete
AASHTO M 190	Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M 196	Corrugated Aluminum Alloy Culverts and Underdrains
AASHTO M 198	Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets
AASHTO M 219	Aluminum Alloy Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M 243	Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M 252	Corrugated Polyethylene Drainage Tubing
AASHTO M 294	Corrugated Polyethylene Pipe, 300 to 1500 mm Diameter
AASHTO M 304	Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO M 324	Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
ASTM A760	Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
ASTM A761	Steel Galvanized, Corrugated Structural Plates and Fasteners for Pipe, Pipe-Arches, and Arches
ASTM A762	Precoated (Polymeric) Galvanized Steel Sewer and Drainage Pipe
ASTM A849	Post-Coated and Lined (Bituminous or Concrete) Corrugated Steel Sewer and Drainage Pipe
ASTM B745	Corrugated Aluminum Alloy Culvert Pipe
ASTM C14	Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C1433	Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers, 3 – 24 in
ASTM C76	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C443	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
ASTM C506	Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
ASTM C507	Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe

ASTM C655	Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
ASTM C700	Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
ASTM D1056	Flexible Cellular Materials--Sponge or Expanded Rubber
ASTM D3034	Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3212	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM F477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F667	Corrugated Polyethylene Pipe and Fittings
ASTM F714	Polyethylene (PE) Plastic Pipe (DR PR) Based on Outside Diameter
ASTM F794	Poly (Vinyl Chloride) Ribbed Drain Pipe & Fittings Based on Controlled Inside Diameter
ASTM F894	Polyethylene (PE) Large Diameter profile Wall Sewer and Drain Pipe
ASTM F949	Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings
ASTM F2435	Steel Reinforced Polyethylene (PE) Corrugated Pipe
ASTM F2562	Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage
ASTM F2736	Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe
ASTM F2764	Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications
ASTM F2881	Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications

ITEM F-170 STEEL BOLLARD

DESCRIPTION

170-1.1 This item consists of replacing and/or installing new steel bollards as shown on the plans or as directed by the Engineer.

MATERIALS

170-2.1 Use materials that conform to the following:

- a. **Steel Pipe.** Use standard weight, Grade B, galvanized, welded, or seamless pipe meeting ASTM A53.
- b. **Concrete.** Use commercial grade concrete with a minimum 28-day compressive strength of 2,500 pounds per square inch (psi) or an approved, pre-mixed, sacked concrete.
- c. **Paint.** Use single component, moisture cure, polyurethane (SC-MC-U) zinc primer. Use single component, moisture cure, aliphatic polyurethane (SC-MC-ALIP-U) safety yellow paint for the top coats.
- d. **Retroreflective Bands.** Use flexible high intensity sheeting, pressure sensitive type, cut to form 6-inch wide reflector bands meeting ASTM D4956, Type III. Use sheeting with a smooth sealed outer surface.

CONSTRUCTION REQUIREMENTS

170-3.1 Install bollards plumb, in hand or mechanically dug holes, backfilled with the specified material, and thoroughly compacted to the satisfaction of the Engineer.

170-3.2 PAINTING. Paint bollards with one coat of primer and two top coats of safety yellow. Ensure that the surfaces are free of all oil, grease, dirt, abrasive residues, and all other foreign substances prior to application of coatings. Maintain the surface to be coated at a minimum temperature of 5 °F above the dew point for the duration of coating application. Adhere to these preparation requirements in addition to any requirements by the coating manufacturer. Repair any nicks, scratches or other paint damage resulting from shipping and handling at the site.

170-3.3 REFLECTIVE BANDS. Apply a minimum of two white retroreflective bands placed 3-4 inches from the top with a maximum of 6 inches between the bands.

METHOD OF MEASUREMENT

170-4.1

- a. **Lump Sum.** No measurement of quantities will be made.
- b. **Unit Prices.** By the number of bollards specified, installed and accepted as completed units in place. Where replacement is specified, each unit shall include removal and installation.

BASIS OF PAYMENT

170-5.1 Payment will include all labor, equipment, materials, and personnel to complete the work described in the plans.

Payment will be made under:

Item F170.010.0000	Steel Bollard – per each
Item F170.020.0000	Steel Bollards – per lump sum

ITEM P-152 EXCAVATION, SUBGRADE, AND EMBANKMENT

DESCRIPTION

152-1.1 This item consists of excavation, hauling, embankment (or waste disposal), placement, grading and compaction of all materials required to construct runway safety areas, taxiway safety areas, runways, taxiways, aprons, drainage, buildings, roadways, parking, and other work. Construct according to the specifications, and conform to the dimensions and typical sections shown on the Plans.

MATERIALS

152-2.1 MATERIAL DEFINITIONS. The Contract will designate material to be removed from within the project lines and grades as classified excavation (common, rock or muck) or as unclassified excavation. Material obtained from outside the project lines and grades is borrow.

All material shall be described as defined below, but no quantity of material shall be defined or paid in more than one category:

- a. **Unclassified Excavation.** All material, regardless of its nature, which is not paid for under another contract item. May include common, rock or muck.
- b. **Common Excavation.** Suitable material such as silt, sand, gravel, and granular material that does not require blasting or ripping. Not rock or muck.
- c. **Rock Excavation.** Rock that cannot be excavated without blasting or ripping, and boulders containing a volume of more than 0.5 cubic yard.
- d. **Muck Excavation.** Soil, organic matter, and other material not suitable for embankment or foundation material, including material that will decay or produce subsidence in the embankment such as stumps, roots, humus, or peat.
- e. **Drainage Excavation.** Excavation made for the primary purpose of controlling drainage including: intercepting, inlet or outlet ditches; temporary levee construction; or any other type as shown on the Plans.
- f. **Borrow.** Suitable material that is required for the construction of embankment or for other portions of the work. Borrow material shall be obtained from sources within the limits of the airport property but outside the project lines and grades, or from sources outside the airport property.
- g. **Foundation Soil.** In-situ soil or undisturbed ground.
- h. **Ditch Lining.** Use crushed or naturally occurring stones that are sound and durable, are not larger than 8 inches in greatest dimension, and containing not more than 50% by weight passing a 3-inch sieve and not more than 5% by weight passing the 1-in sieve as determined by ATM 304, or as accepted by the Engineer.

152-2.2 UNSUITABLE MATERIAL. Material that does not meet the testing requirement for suitable material. Material containing vegetable or organic matter, such as muck, peat, organic silt, or sod is considered unsuitable for use in embankment construction. Material that is contaminated by hazardous substances, including fuel or oil, in greater quantity than state and federal standards allow is considered unsuitable for use.

152-2.3 SUITABLE MATERIAL. Suitable material may be obtained from classified excavation, unclassified excavation, or borrow. The Engineer will approve material as "suitable" for use in embankment when the material meets the following criteria:

- a. Sand, rock, gravel, silt, concrete, asphalt pavement, and other inorganic material;

- b. Gradation of 100% by weight passing 6 inch screen; and
- c. Meets definition of Non-Frost Susceptible in GCP Subsection 10-03, except delete "6%" and replace with "10%" (passing No. 200 screen).

The Engineer may, in their discretion, approve oversize material as "suitable" for use in embankment when the material meets the following criteria:

- a. Sand, rock, gravel, silt, concrete, asphalt pavement, and other inorganic material;
- b. Gradation of 100% by weight passing 24 inch screen;
- c. Meets definition of Non-Frost Susceptible in GCP Subsection 10-03, except delete "6%" and replace with "10%" (passing No. 200 screen); and
- d. Rock is well graded with an even distribution of rock sizes, and can be compacted with a minimal amount of voids.

CONSTRUCTION METHODS

152-3.1 GENERAL. Perform all necessary clearing and grubbing in accordance with Item P-151, and construction surveying in accordance with Item G-135, including staking of lines and grades, prior to beginning excavation, grading, and embankment operations in any area.

The suitability of material to be placed in embankments shall be subject to approval by the Engineer. Material with organics, when approved by the Engineer as suitable to support vegetation, may be used on top of the embankment slope.

Unsuitable material shall be disposed of in waste areas shown on the Plans or in locations acceptable to the Engineer. Material contaminated by hazardous substances shall require special handling and disposal, performed according to GCP Subsection 70-11.f. and using methods acceptable to the Engineer.

- a. **Waste Areas.** All waste areas shall be graded to allow positive drainage of the area and of adjacent areas. The surface elevation of waste areas shall not extend above the surface elevation of adjacent usable areas of the airport, unless specified on the Plans or approved by the Engineer. Unsuitable material shall not be left in windrows or piles, and shall not extend into the Obstacle-Free Zone as shown on the plans.

All waste areas shall be protected from erosion according to the SWPPP. Areas where seeding is called for, in which the top layer of soil material has become compacted, by hauling or other activities of the Contractor shall be scarified and disked to a depth of 4 inches, in order to loosen and pulverize the soil.

The Contractor shall obtain all permits required for placing waste in areas they choose, and which are not covered by Department obtained permits. When the Contractor is required to locate a disposal area outside the airport property limits at his/her own expense, he shall obtain and file with the Engineer, permission in writing from the property owner for the use of private property for this purpose.

- b. **Utility Work.** Utility work shall be performed, and compensation claims for utility work made, according to GCP Subsection 50-06. If it is necessary to work thorough or around existing utilities or associated structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve the utilities or provide temporary services. When utilities not shown on the Plans are encountered, the Contractor shall immediately notify the Engineer, and the Engineer will determine the disposition of the utility. The Contractor shall, at no additional cost to the Department, satisfactorily repair or pay the cost of all damage to utilities or associated structures which may result from any of the Contractor's operations.

152-3.2 EXCAVATION. No excavation shall be started until the Contractor has construction surveyed the work, including staking the lines and grades, and the Engineer has reviewed stakes, elevations and measurements of the ground surface. As required in GCP Subsection 40-04, all Useable Excavation of suitable material shall be used in the formation of embankment or for other purposes shown on the Plans. All unsuitable material shall be disposed of in waste areas as shown on the Plans or as directed by the Engineer.

When the volume of the Useable Excavation exceeds that required to construct the embankments to the grades indicated, the excess material shall be used to grade the areas of ultimate development or disposed of as directed. When the volume of Useable Excavation is not sufficient for constructing the fill to the grades indicated, borrow shall be used to make up the deficiency.

The grade shall be maintained so that the surface is well drained at all times. When necessary, temporary drains and drainage ditches shall be installed to intercept or divert surface water that may affect the work. All temporary drains and drainage ditches shall be constructed and maintained according to the SWPPP.

In cuts, all loose or protruding rocks on the back slopes shall be scaled or otherwise removed to line of finished grade of slope. All cut-and-fill slopes shall be uniformly dressed to the slope, cross section, and alignment shown on the Plans or as directed by the Engineer.

- a. **Selective Grading.** When selective grading is required, the more suitable material as designated by the Engineer shall be used in constructing the upper layers of the embankment or pavement structure. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas.
- b. **Undercutting.** Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for runways, taxiways, safety areas, subgrades, roads, shoulders, or any areas intended for turfing shall be excavated to a minimum depth of 12 inches below the subgrade, or to the depth directed by the Engineer. Muck, peat, matted roots, or other yielding material that is unsatisfactory for foundation soil compaction, shall be removed to the depth specified. Unsuitable materials shall be disposed of at locations shown on the Plans. The excavated area shall be backfilled with suitable material, obtained from the grading operations or borrow areas and thoroughly compacted as specified. Where rock cuts are made and backfilled with suitable material. Any pockets created in the rock surface shall be drained according to the details shown on the Plans. The material removed will be paid as Unclassified Excavation.
- c. **Overbreak.** Overbreak, including slides, is that portion of any material displaced or loosened beyond the finished work, as planned or authorized by the Engineer. All overbreak shall be graded or removed by the Contractor and disposed of as directed by the Engineer. Payment will not be made for the removal and disposal of overbreak which the Engineer determines as avoidable. Unavoidable overbreak will be paid as Unclassified Excavation.
- d. **Removal of Structures and Utilities.** The Contractor shall accomplish the removal of existing structures and utilities that are specified to be removed or demolished, except when another entity is identified in the Contract to accomplish the work. All existing structural foundations shall be excavated and removed to a depth at least 2 feet below the top of subgrade or as indicated on the Plans, and the material disposed of as directed. Holes left after removing foundations shall be backfilled with suitable material and compacted as specified. The material will be paid as Unclassified Excavation.
- e. **Foundation Soil Compaction Requirements.** In areas of excavation, the top 6 inches of foundation soil under areas serving aircraft or vehicle traffic loadings shall be compacted to a density of not less than 95% of the maximum density as determined by ATM 207, ATM 212, or ATM 309. The in-place field density and moisture content shall be determined according to ATM 213.

Compaction of the foundation soil is a subsidiary cost to excavation.

The Engineer may direct the Contractor to over excavate foundation soil that is soft or compresses excessively, and to backfill excavation with compacted suitable material. The material will be paid as Unclassified Excavation.

- f. **Blasting.** Blasting will be permitted only when proper precautions are taken for the safety of all persons, the work, and the property. The Contractor is responsible for blasting operations including the requirements of GCP Subsection 70-10. All damage done to the work or property shall be repaired at the Contractor's expense. All operations of the Contractor in connection with the transportation, storage, and use of explosives shall conform to all federal, state, local regulations, explosive manufacturers' instructions, and approved permits.

The Contractor shall submit a Safety Plan that includes descriptions of road and runway closures, warning signals; and plans for notification of affected local, state, and federal agencies, the airport manager, and other interested parties. Discuss in the Safety Plan methods for protection of life and health, public and private property, new work or existing work on the project, nearby structures, wetlands, waters and wildlife. When working within airport property include an emergency response contingency to clear runways of debris, to repair damaged navigational or visual aids; and get a NOTAMs before blasting. Hold a safety meeting prior to commencement of blasting operations to address safety issues.

In each distinct blasting area the Contractor shall submit a blasting plan, prepared by a qualified blaster, to the Engineer. This plan must consist of hole size, depth, spacing, burden, type of explosives, type of delay sequence, maximum amount of explosive on any one delay period, depth of rock, and depth of overburden if any. The maximum explosive charge weights per delay included in the plan shall not be increased without submitting a revised blasting plan to the Engineer.

When blasting, the Safety Plan and the Blasting Plan shall conform to FAA Order 7400.2 *Procedures for Handling Airspace Matters*, Chapter 27, and AC 150/5370-2 *Operational Safety on Airports During Construction*.

The Contractor shall keep a record of each blast fired, its date, time, and location; the amount of explosives used, maximum explosive charge weight per delay period, and, where necessary, seismograph records identified by instrument number and location. These records shall be made available daily to the Engineer.

The Engineer will keep the submitted plans and records, and has authority to review and reject plans.

152-3.3 BORROW SOURCES. Borrow sources within the airport property if available will be identified on the Plans. Excavation of borrow on airport property shall be made only at these identified locations and within the lines and grades staked.

Borrow sources outside of airport property may be identified in the Contract according to GCP Subsection 60-02. The Contractor shall furnish additional borrow sources if necessary.

Removal of overburden and waste material, permit costs, mineral royalties, and other costs of material source development are subsidiary and shall be included in the unit price for borrow.

152-3.4 DRAINAGE EXCAVATION. Drainage excavation for intercepting, inlet or outlet drains; for temporary levee construction; or for any other type as designed or as shown on the Plans. The work shall be performed in the proper sequence with the other construction and according to the SWPPP. All suitable material shall be placed in embankment fills; unsuitable material shall be placed in waste areas or as directed by the Engineer. Intercepting ditches shall be constructed prior to starting adjacent excavation operations. All necessary work shall be performed to secure a finish true to line, elevation, and cross section.

The Contractor shall maintain ditches constructed on the project to the required cross section and shall keep them free of debris or obstructions until the project is accepted.

Place and spread ditch lining materials so that the finished face is uniform and conforms with the lines and slope shown on the Plans or as directed.

152-3.5 PREPARATION OF EMBANKMENT AREA. In areas of Clearing and Grubbing, completely break up the subgrade by plowing or scarifying to a minimum depth of 6 inches. Where an embankment is to be constructed to a height of 4 feet or less, or where the embankment supports asphalt or concrete paving, compact the subgrade as indicated in Subsection 152-3.2.e. Where the height of fill is greater than 4 feet and the embankment does not support asphalt or concrete paving, compact the subgrade to the density of the surrounding ground before construction of embankment.

When new embankment is placed on slopes steeper than 4:1, the existing ground shall be continuously benched over the areas as the work is brought up in layers. Benching shall be of sufficient width to permit placing of material and compacting operations. Each horizontal cut shall begin at the intersection of the original ground and the vertical side of the previous bench. Material thus cut out and deemed suitable shall be blended and incorporated into the new embankment.

No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the respective items of work.

152-3.6 FORMATION OF EMBANKMENTS. Embankments shall be formed in successive horizontal layers of not more than 8 inches in loose depth for the full width of the cross section, unless otherwise approved by the Engineer.

The grading and compaction operations shall be conducted, and the various soil strata shall be placed, to produce an embankment as shown on the typical cross section or as directed by the Engineer. Materials such as brush, hedge, roots, stumps, grass and other unsuitable material, shall not be incorporated or buried in the embankment.

- a. **Suspension of Operations.** Operations on earthwork shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing, moisture content or other unsatisfactory conditions of the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide proper surface drainage.
- b. **Soft Foundations.** When embankments are to be constructed across wet or swampy ground, which will not support the weight of heavy hauling and spreading equipment, the Contractor shall use methods of embankment construction, and use hauling and spreading equipment, that will least disturb the soft foundation (defined as having a California Bearing Ratio less than 3). When soft foundations are encountered, and when approved by the Engineer, the lower part of the fill may be constructed by dumping and spreading successive vehicle loads in a uniformly distributed layer of a thickness not greater than that necessary to support the vehicle while placing subsequent layers, after which the remainder of the embankment shall be constructed in layers and compacted as specified. The Contractor shall not be required to compact the soft foundation, and at the Engineer's option, may not be required to clear and grub.
- c. **Moisture.** The material in the layer being placed shall be within $\pm 2\%$ of optimum moisture content before rolling to obtain the prescribed compaction. In order to achieve a uniform moisture content throughout the layer, wetting or drying of the material and manipulation shall be performed when necessary. Should the material be too wet to permit proper compaction or rolling, all work on all of the affected portions of the embankment shall be delayed until the material has dried to the required moisture content. Watering of dry material to obtain the proper moisture content shall be done with approved equipment that will sufficiently distribute the water. Sufficient equipment to furnish the required water shall be available at all times.

- d. **Compaction.** Rolling operations shall be continued until the embankment is compacted to not less than 95% of maximum density as determined by ATM 207 or ATM 212. Under all areas serving aircraft or vehicle traffic loadings, the embankment shall be compacted to a density of not less than 98% of the maximum density as determined by ATM 207 or ATM 212. The in-place field density and moisture content shall be determined according ATM 202.

Keep dumping and rolling areas separate. Do not cover any layer by another until the proper density is obtained.

During construction of the embankment, the Contractor shall route their equipment at all times, both when loaded and when empty, over the layers as they are placed and shall distribute the travel evenly over the entire width of the embankment. The equipment shall be operated in such a manner that hardpan, cemented gravel, clay, or other chunky soil material will be broken up into small particles and become incorporated with the other material in the layer.

In the construction of embankments, layer placement shall begin in the deepest portion of the fill and progress in layers approximately parallel to the finished pavement grade line. Stones or fragmentary rock larger than 3 inches in their greatest dimensions will not be allowed in the top 6 inches of the embankment.

- e. **Oversize Material.** At the Engineer's discretion and direction, the Contractor may use oversize material or rockfill, as defined in Subsection 152-2.3, in the embankment. Place material in layers up to 2 feet thick. Fill voids with finer material. Level and smooth each layer with suitable leveling equipment. Use compaction equipment and construction methods that can form a dense, well-compacted embankment. Do not use oversize material within 4 feet of the top of finished subgrade.

Rock or boulders larger than 2 feet in thickness shall either be disposed of outside the excavation or embankment areas, in places and in the manner designated by the Engineer; or they may be crushed to less than 2 feet thickness and used in the embankment.

- f. **Subsidiary Costs.** Excavation and embankment is a single pay item; there will be no separate measurement or payment. The costs for material source development, blasting, excavation, hauling, placing in layers, compacting, diking, watering, mixing, sloping, grading, and other necessary operations for construction of embankments, are subsidiary and shall be included in the contract unit prices for excavation, borrow, or other pay items.

- g. **Frozen Material.** Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material, unless this construction method is identified in the special provisions, or is part of a Contractor's Progress Schedule that the Engineer has approved.

152-3.7 FINISHING AND PROTECTION OF SUBGRADE. After the subgrade has been substantially completed, the full width shall be conditioned by removing any soft or other unstable material that will not compact properly. The resulting areas and all other low areas, holes or depressions shall be brought to finish subgrade elevation with suitable material. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade, whose top is shaped to the lines and grades shown on the Plans.

Grading of the top of subgrade shall be performed so that it will drain readily. The Contractor shall take all precautions necessary to protect the subgrade from damage. The Contractor shall limit hauling over the finished subgrade to that which is essential for construction purposes.

All ruts, ponds or rough places that develop in a completed subgrade shall be repaired, smoothed and recompacted before another layer is placed on top of the subgrade.

No subbase, or surface course shall be placed on the subgrade until the subgrade has been approved by the Engineer. Erosion and sediment control shall be done according to the SWPPP. Work described in this subsection is subsidiary and shall be included in the contract unit prices.

152-3.8 TOLERANCES. In those areas upon which a subbase or base course is to be placed, the top of the subgrade shall be of such smoothness that, when tested with a 12-foot straightedge applied parallel and at right angles to the centerline, it shall not show any deviation in excess of 1/2 inch, or shall not be more than 0.05 foot from true grade as established by grade hubs or pins. Any deviation in excess of these amounts shall be corrected by loosening, adding, or removing materials; reshaping; and recompacting by watering and rolling.

On Runway Safety Areas, intermediate and other designated areas, the surface shall be of such smoothness that it will not vary more than 0.10 foot from true grade as established by grade hubs. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-3.9 TOPSOIL. When topsoil is specified or required as shown on the plans or under Item T-905, it may be salvaged from stripping or other grading operations. The topsoil shall meet the requirements of Item T-905. The material may be stockpiled at approved locations in conformance with the CSPP.

Upon completion of grading operations, topsoil shall be handled and placed as directed, or as required in Item T-905. No direct payment will be made for topsoil under Item P-152.

METHOD OF MEASUREMENT

152-4.1 The quantity of unclassified excavation, common excavation, rock excavation, and muck excavation, will be measured in cubic yards of excavated material, measured in its original position. Pay quantities will be computed to the neat lines staked, by the method of average end areas of materials acceptably excavated. Measurement will not include the quantity of materials excavated without authorization beyond project lines and grades, or the quantity of material used for purposes other than those directed or approved by the Engineer.

With the Engineer's written approval, excavation may be measured by any method described in Subsection 152-4.2.

152-4.2 The quantity of Borrow material to be paid will be by calculated by one of the following methods of measurement, as described in the Bid Schedule.

If Borrow is paid by source volume, the quantity will be measured in cubic yards of material, measured in its original position at the borrow source, after stripping of overburden and waste. Pay quantities will be computed by the method of average end areas from cross sections taken before and after borrow excavation. No shrink or swell factor will be used.

If Borrow is paid by design volume, the quantity will be measured in cubic yards of material, measured in its final compacted position. Pay quantities will be computed by the method of average end areas, as determined from original ground cross sections before placement (after clearing and grubbing) and to the neat lines staked and verified by the Engineer after placement. No allowance will be made for subsidence of the subgrade or for material placed outside the staked neat line limits. The quantity to be paid for will be the cubic yards of material placed and accepted in the completed embankment. No shrink or swell factor will be used.

If Borrow is paid by weight, the quantity will be measured in tons.

152-4.3 Ditch Lining will be weighed by the ton or measured by the cubic yard in final position. Excavation required below normal ditch grade is subsidiary.

BASIS OF PAYMENT

152-5.1 Excavation and embankment (or waste disposal) is a single pay item. The costs for material source development, blasting, excavation, hauling, placing in layers, compacting, disking, watering, mixing, sloping, grading, and other necessary operations for construction of embankments, or waste disposal, are subsidiary and shall be included in the contract unit prices.

- a. For “Unclassified Excavation” payment will be made at the contract unit price per cubic yard.
- b. For “Common Excavation” payment will be made at the contract unit price per cubic yard.
- c. For “Rock Excavation” payment will be made at the contract unit price per cubic yard.
- d. For “Muck Excavation” payment will be made at the contract unit price per cubic yard.
- e. For “Drainage Excavation” payment will be made at the contract unit price per cubic yard.
- f. For “Borrow” payment will be made at the contract unit price per cubic yard. If by weight, payment will be made at the contract unit price per ton.

Payment will be made under:

Item P152.010.0000	Unclassified Excavation – per cubic yard
Item P152.030.0000	Common Excavation – per cubic yard
Item P152.040.0000	Rock Excavation – per cubic yard
Item P152.050.0000	Muck Excavation – per cubic yard
Item P152.070.0000	Drainage Excavation – per cubic yard
Item P152.190.____	Borrow, Type ____ – per cubic yard
Item P152.200.____	Borrow, Type ____ – per ton
Item P152.390.0000	Ditch Lining – per ton
Item P152.400.0000	Ditch Lining – per cubic yard

REFERENCES

ATM 202	WAQTC FOP for AASHTO T 255/T 265 Moisture Content of Aggregate and Soils
ATM 207	WAQTC FOP for AASHTO T 99/ T 180 Moisture-Density Relations of Soils
ATM 212	Determining the Standard Density of Coarse Granular Materials using the Vibratory Compactor
ATM 213	WAQTC FOP for AASHTO T 310 In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ATM 304	WAQTC FOP for AASHTO T 27/T 11 Sieve Analysis of Fine and Coarse Aggregates
ATM 309	Relative Standard Density of Soils by the Control Strip Method

ITEM P-185 ARMOR STONE

DESCRIPTION

185-1.1 Furnish all plant, labor, equipment and materials and perform the work necessary to manufacture and place stone protection on both ends of the runway as shown on the plans or as directed by the Engineer.

MATERIAL

185-2.1 GENERAL. Conform to the following quality and gradation requirements. Submit a quarrying, blasting and processing plan to the Engineer for required materials. Do not place materials prior to acceptance.

Provide primary armor and filter or underlayer stone; stone shall not be elongated or tabular. The minimum dimension of each individual stone shall be at least one-third of the stone's maximum dimension. Provide stone that conforms to the specified size requirements after processing. Conduct loading, placement or stockpiling operations in a manner that eliminates breakage. Comply with the following requirements for armor stone

- a. **Primary Armor and Filter Stone.** Provide uniformly graded stone that falls within the limits shown in the following gradations, based on class:

Primary Armor Stone - Class _____		
<u>Stone Weight</u>	<u>Approximate Diameter</u>	<u>Allowable % Smaller by Stone Count</u>
___ lb	___ inch	100%
___ lb	___ inch	0-50%
___ lb	___ inch	0%

Filter Stone		
<u>Stone Weight</u>	<u>Approximate Diameter</u>	<u>Allowable % Smaller by Stone Count</u>
___ lb	___ inch	100%
___ lb	___ inch	0-50%
___ lb	___ inch	0%

- b. **Underlayer Stone.** Provide uniformly graded underlayer stone that falls within the limits shown in the following gradations, based on class:

Underlayer Stone - Class ___ lb		
<u>Stone Weight</u>	<u>Approximate Diameter</u>	<u>Allowable % Smaller by Stone Count</u>
___ lb	___ inch	100%
___ lb	___ inch	0-50%
___ lb	___ inch	0%

CONSTRUCTION METHODS

185-3.1 GENERAL. Provide a level, compact area large enough to dump and sort at approved location(s). Dump the loads specified in this area and assist the Engineer as needed to sort and measure the stones in the load to determine if the riprap is within specifications. Provide the equipment needed to assist in this sorting.

Place primary armor and filter or underlayer stones on prepared slopes within the limits shown on the plans. Construct a uniform and regular surface with slopes no steeper than those shown on the plans. Maintain the armor stone until final acceptance, and replace any displaced material to the design slopes, lines, and grades at the Contractor's expense.

Place materials in a manner that produces a well-keyed mass of stone, with each individual stone having three points of contact. Ensure that finished surfaces of all layers are free from pockets of single sized stone. Placement of small stone in primary armor and filter or underlayer stone layers to choke the spaces between large stones or for leveling the surface is not permitted. Breaking of individual pieces in place by blasting or mechanical methods is not permitted. Place filter or underlayer stone to the full course thickness in one operation and in a manner that avoids displacing underlying materials. Placement by methods likely to cause segregation, such as end dumping, side dumping or pushing into position with earth-moving equipment, are not permitted. Obtain the desired distribution of various sizes of armor stones throughout the mass by selective loading and by controlled placement of successive loads during placement. Materials that do not meet the specified requirements for size, quality or distribution of sizes will not be allowed for use.

Orient each stone individually so that the long axis of the stone is perpendicular to the structure's sloped surface. Rearrange individual stones as required to the extent necessary to correct deficiencies and to provide a uniform, well-keyed slope.

Place each class of stone to the full thickness and depth shown on the drawings. No minus tolerance is permitted. A greater thickness is permitted provided the outside slopes present a uniform appearance with a minimum of pieces projecting outside the plane of the finished slope surface. A greater depth is permitted in the toe apron provided uniform appearance and finished depths are maintained.

Stone of a certain weight classification that is rejected because of cracks or seam defects, as described in the Quality Control subsection of this specification, may be used for a lower weight classification if other quality and shape requirements are met.

185-3.2 CONSTRUCTION SEQUENCING. Schedule construction activities in general conformance with the following sequencing plan.

- a. Clearly delineate the limits of use of each type of stone, both in the field and on as-built drawings.
- b. Construct the embankment and slope protection in conformance with the plans and specifications.

185-3.3 QUALITY CONTROL. Establish and maintain quality control for stone to assure compliance with contract requirements and to maintain records of its quality control for all operations, including but not limited to the following

- a. Produce stone of the size specified, verifying sizes by selected samples when requested by the Engineer.

Acceptability of stone quality is determined by visual inspection. The Engineer may reject materials not found to meet the specified requirements at any time during the performance of the contract, at the source or project site.

- a. Test stone material for weight, gradation, and shape to assure compliance with the specifications. Conduct tests at the production site before transporting materials to the project site. Place materials that do not meet the specified requirements in a separate area to assure they do not get mixed in with acceptable materials. Perform tests at uniform intervals throughout the project to meet testing frequency requirements.
- b. Before delivery of materials to the project site, meet with the Engineer at the production site and select stones that meet the required weight and shape. Set aside stones at the production site as

reference samples. Select reference samples representing each size in the stone gradation and clearly mark and retain until completion of the project.

c. Testing frequency for this project is shown below

<u>STONE</u>	<u>TYPE OF TEST</u>	<u>NO. OF TESTS</u>
Primary Armor	Visual Inspection/Measurement	10% of Stones
	Weight	10% of Stones
Filter or Underlayer	Measurement	1% of Material Produced
	Weight	1% of Stones

Tests, other than weight, are on individual stones. Failing tests do not count toward the number of tests required. Increase testing frequency as necessary to maintain quality control during production.

- 1. Visual Inspections** Make a visual check of the stones at the production site for elongation, cracks, deterioration, and other defects visible to the naked eye, on at least $\frac{2}{3}$ of the surface area of the stone. Wet five percent of the stones checked for cracks and re-inspected for minute cracks to determine if they are detrimental to the stone quality and if additional inspections are necessary on all stone. Do not transport stones with cracks that are detrimental to stone longevity to the placement site.
- 2. Measurement** Measure stones on three mutually perpendicular axes and compute weight using the appropriate specific gravity. Record computed weights and measurements daily and provide signed copies to the Engineer before the start of the next work shift. Select stones for measurement that represent all sizes specified in order to verify conformance with specified shape and grading limits.
- 3. Weight** In addition to weighing for payment purposes, weigh primary armor in order to verify conformance with the gradation limits specified. Accomplish by placing stones of similar size into a truck or loader, weighing the stones, and calculating an average individual stone weight (e.g., 20 stones placed in a truck weigh 20,000 pounds; this is equivalent to 20 stones with an average weight of $20,000/20 = 1,000$ pounds). Use other methods of weighing stones for grading purposes only if approved by the Engineer.

Provide quality test results meeting the following requirements as performed by a certified lab

PROPERTY	TEST METHOD	LIMITS
Specific gravity (SSD)	AASHTO T 85	2.65 min.
Absorption	ASTM C97	2% max.
Soundness (Sodium Sulfate)	ASTM C88	5% max. loss
Solubility & Durability (Ethylene Glycol)	COE CRD-C-148	2% max. loss after 15 days
LA Abrasion	ASTM C535	10% max. loss after 200 revs. and 50% max. loss after 1000 revs.

185-3.4 PLACEMENT. Before placing armor materials, establish clear and understandable construction control for the workers. Establish minimum control to delineate the horizontal limits of all stone classes, both toe and shoulder lines. Unless specified in writing, follow the slope lines and grades indicated on the drawings for the limits of the in-place stone.

Survey each layer to document material placement. Make periodic checks as the work progresses to verify line and grade of the armor placement. Provide a copy of the check surveys to the Engineer and obtain approval before placing the next layer of material. Approval of cross-sections does not constitute final acceptance. Take cross-sections at 25-foot intervals and at the ends of each typical section range. Take horizontal cross-section at 5-foot intervals and at grade breaks along the survey grades.

Submit a plan detailing how the check surveys will be completed, including the methodology and equipment proposed. Do not place stones until the Engineer approves the method for performing check surveys.

METHOD OF MEASUREMENT

185-4.1 Primary armor stone and filter or underlayer stone will be measured by the tons of material placed, based on project weight records, and in accordance with the dimensions shown on the plans, or as directed by the Engineer. No payment will be made for material placed in excess of these dimensions.

BASIS OF PAYMENT

185-5.1 Payment for primary armor and filter or underlayer stone will be made at the contract unit price and includes all labor, materials, tools, equipment, testing, and incidentals required to construct shore protection.

Payment will be made under:

Item P185.____.____	Primary Armor Stone, Class ____ – per ton
Item P185.____.____	Underlayer Stone, Class ____ – per ton
Item P185.170.0000	Filter Stone – per ton

REFERENCES

AASHTO T 85	Specific Gravity and Absorption of Coarse Aggregate
ASTM C88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C97	Absorption and Bulk Specific Gravity of Dimension Stone
ASTM C535	Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
COE CRD-C-148	Method of Testing Stone for Expansive Breakdown on Soaking in Ethylene Glycol

**ITEM P-207 IN-PLACE FULL DEPTH RECLAMATION (FDR)
RECYCLED ASPHALT AGGREGATE BASE COURSE**

DESCRIPTION

207-1.1 This item consists of a recycled asphalt aggregate base course resulting from the in-place full depth reclamation (FDR) of the existing pavement section (asphalt wearing surface and aggregate base), plus mechanical stabilization with additional aggregate or chemical stabilization with Portland cement, or asphalt emulsion, when shown on the plans.

MATERIALS

207-2.1 AGGREGATE. The FDR shall consist of materials produced by recycling (pulverizing and mixing) the existing asphalt pavement, aggregate base, subgrade, and any additional aggregate as necessary. .

The FDR shall meet the gradation in Table 207-1, below.

TABLE 207-1. FDR GRADATION

Sieve	Minimum Percentage by weight passing sieves
1-1/2-inch	100
1-inch	90-100

- a. **Deleterious substances.** Materials for aggregate base shall be kept free from weeds, sticks, grass, roots and other foreign matter.
- b. **Uniformity.** The materials shall be thoroughly recycled (pulverized and mixed) to ensure a uniform gradation.

207-2.2 STABILIZATION.

- a. **Mechanical stabilization.** Addition of corrective aggregate material to adjust gradation shall be equivalent to P-209 Crushed Aggregate Base Course.
- b. **Chemical Stabilization.** Provide the specific chemical stabilization material designated in the Plans. Portland cement shall meet the requirements of AASHTO M 85. Emulsified asphalt cement shall meet the requirements of AASHTO M 140. Cationic emulsified asphalt shall meet the requirements of AASHTO M 208. Materials shall be handled, stored, and applied in accordance with all federal, state, and local requirements.

207-2.3 WATER. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

207-2.4 QUALITY CONTROL (QC) SAMPLING AND TESTING. The Contractor shall take at least two FDR samples per day of production in the presence of the Engineer to check the gradation. Sampling shall be per ATM 301. Material shall meet the requirements in paragraph 207-2.1. Samples shall be taken from the in-place, un-compacted material at random sampling locations according to ATM SP 4.

CONSTRUCTION METHODS

207-3.1 MILLING. The existing asphalt pavement shall be milled to the depth below surface grade shown on the plans.

207-3.2 CONTROL STRIP. The control strip shall be 12 feet in width and 300 feet in length. The Engineer will designate the location of control strips. The Contractor shall demonstrate, in the presence of the Engineer, that the materials, equipment, and construction processes meet the requirements of the

specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. Control strips that do not meet specification requirements shall be reworked, re-compacted, or removed and replaced at the Contractor's expense. Full operations shall not begin until the control strip has been accepted by the Engineer. Upon acceptance of the control strip by the Engineer, the Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved in advance by the Engineer.

207-3.3 RECYCLING (PULVERIZATION AND MIXING). The asphalt pavement and aggregate base shall be recycled (pulverized and mixed) into a uniformly blended mixture to the depth shown on the plans. Add mechanical and chemical stabilization materials of the type(s) and in proportions shown on the plans to the mixture of asphalt pavement and aggregate base. All material over approximately 1-1/2 inches will be removed by the Contractor. The mixture shall be brought to the desired moisture content.

The maximum lift thickness of the recycled aggregate base course material to be compacted is shown on the plans.

207-3.4 GRADING AND COMPACTION. Immediately upon completion of recycling (pulverization and mixing), the material shall be shaped and graded in accordance with the project plans. The Engineer will use ATM 412 to determine the density standard from the control strip. The recycled asphalt aggregate base course shall be compacted within the same day to an in-place density of 98 percent as determined by ATM 411. Compact the remainder of the project to not less than 98 percent of the density standard, in accordance with ATM 411. The number, type and weight of rollers shall be sufficient to compact the material to the required density.

207-3.5 FINISHING. The surface of the aggregate base course shall be finished by blading or with automated equipment designed for this purpose. If the top layer is 1/2 inch or more below grade, the top layer shall be scarified to a depth of at least 3 inches, new material added, and the layer blended and re-compacted to bring it to grade. The addition of layers less than 3 inches shall not be allowed.

207-3.6 PROOF ROLLING. Compacted asphalt aggregate base course shall be proof rolled with a tandem axle dual wheel dump truck loaded to the legal limit with tires inflated to 80 psi in the presence of the Engineer. Soft areas that deflect greater than 0.5 inch or show permanent deformation greater than 0.5 inch shall be removed and reworked at the Contractor's expense.

207-3.7 WEATHER LIMITATIONS. When weather conditions detrimentally affect the construction process and/or quality of the materials, the Contractor shall stop construction. Portland cement shall not be applied when wind conditions affect the distribution of the materials. Do not use any frozen material or compact on a frozen base. Construction shall not be performed unless the atmospheric temperature is above 35°F and rising or approved by the Engineer. When the temperature falls below 35°F, protect all completed areas against detrimental effects of freezing by approved methods. Correct completed areas damaged by freezing, rainfall, or other weather conditions to meet specified requirements.

207-3.8 MAINTENANCE. The asphalt aggregate base course shall be maintained in a satisfactory condition until the work is accepted by the Engineer. Equipment used in the construction of an adjoining section may be routed over completed sections of asphalt aggregate base course, provided that no damage results and equipment is routed over the full width of the completed asphalt aggregate base course. Any damage to the recycled asphalt aggregate base course shall be repaired by the Contractor at the Contractor's expense.

207-3.9 SURFACE TOLERANCES. The finished surface shall be tested for smoothness and accuracy of grade. Any area failing smoothness or grade shall be scarified to a depth of at least 3 inches, reshaped and re-compacted by the Contractor at the Contractor's expense.

- a. **Smoothness.** The finished surface shall not vary more than 3/8-inch when tested with a 12-foot straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot straightedge for the full length of each line on a 50-foot grid.

- b. **Grade.** The grade shall be measured on a 50-foot grid and shall be within +0 and -1/2 inch of the specified grade.

207-3.10 ACCEPTANCE SAMPLING AND TESTING FOR DENSITY. FDR base course will be accepted for density and thickness on an area basis. One (1) test for density and thickness will be made for each 1200 square yds. Sampling locations will be determined on a random basis in accordance with ATM SP 4.

- a. **Density.** The Engineer will perform all density tests.

Each area will be accepted for density when the field density is at least 98 percent of the density standard of the FDR base course in accordance with ATM 412. The in-place field density will be determined in accordance with ATM 411, and ATM 411 will be used to determine the moisture content of the material. The machine will be calibrated in accordance with ATM 411. If the specified density is not attained, the area represented by the failed test must be reworked and/or recompacted and two additional random tests made. This procedure will be followed until the specified density is reached.

- b. **Thickness.** The thickness of the base course shall be within +0 and -1/2 inch of the specified thickness as determined by depth tests taken by the Contractor in the presence of the Engineer for each area. Where the thickness is deficient by more than 1/2-inch, the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches, adding new material, and recompacted to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken.

METHOD OF MEASUREMENT

207-4.1 See GCP Section 90, and the following:

- a. FDR asphalt aggregate base course, by the area of the finished top surface.
- b. Emulsified asphalt, by the ton.
- c. Portland cement, by the ton.
- d. FDR asphalt aggregate base course, by Lump Sum. Chemical stabilization is subsidiary.

BASIS OF PAYMENT

207-5.1 Payment will be made at the contract unit price, per unit of measurement, accepted in place. Corrective aggregate material, if required, will be paid under Item P-209.

Payment will be made under:

P207.110.0000	FDR Asphalt Aggregate Base Course - per square yard
P207.120.0000	FDR Asphalt Aggregate Base Course - per lump sum
P207.130.0000	Emulsified Asphalt - per ton
P207.140.0000	Portland Cement - per ton

REFERENCES

AASHTO M 85	Portland Cement
AASHTO M 140	Emulsified Asphalt
AASHTO M 208	Cationic Emulsified Asphalt
ASTM C1602	Mixing Water Used in the Production of Hydraulic Cement Concrete

ATM 301	Sampling of Aggregates FOP for AASHTO T 2
ATM 411	WAQTC FOP for AASHTO T 355 In-Place Density of Asphalt Mixtures By Nuclear Methods
ATM 412	Relative Standard Density of Treated Mixtures by the Control Strip Method
ATM SP 4	Random Sampling

ITEM P-209 CRUSHED AGGREGATE BASE COURSE

DESCRIPTION

209-1.1 This item consists of a base course composed of crushed aggregate constructed on a prepared course in accordance with these Specifications and to the dimensions and typical cross-sections shown on the Plans.

MATERIALS

209-2.1 CRUSHED AGGREGATE BASE. Crushed aggregate shall consist of clean, sound, durable particles of crushed stone or crushed gravel and shall be free from excess coatings of clay, silt, organic material, clay lumps or balls or other deleterious materials. The method used to produce the crushed gravel shall result in the fractured particles in the finished product as consistent and uniform as practicable. Fine aggregate passing the No. 4 sieve shall consist of fines from the coarse aggregate crushing operation. If necessary, fine aggregate may be added to produce the correct gradation. The fine aggregate shall be produced by crushing stone and gravel that meet the coarse aggregate requirements for wear and soundness. Aggregate base material requirements are listed in Table 209-1.

**TABLE 209-1
CRUSHED AGGREGATE BASE MATERIAL REQUIREMENTS**

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	AASHTO T 96
Soundness of Aggregates by Use of Sodium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate	AASHTO T 104
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least two fractured faces and 100% with at least one fractured face ¹	ATM 305
Flat Particles, Elongated Particles, or Flat and Elongated Particles	10% maximum, by weight, of flat, elongated, or flat and elongated particles ²	ATM 306
Micro-Deval	25% maximum	AASHTO T 327
Fine Aggregate		
Liquid limit	Less than or equal to 25	ATM 204
Plasticity Index	Not more than six (6)	ATM 205

¹ The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

² A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

209-2.2 GRADATION REQUIREMENTS. The gradation of the final aggregate base material shall meet the requirements of the gradation given in Table 209-2 when tested per ATM 304. The gradation shall be well graded from coarse to fine and shall not vary from the lower limit on one sieve to the high limit on an adjacent sieve or vice versa. Use Gradation D-1 unless specified otherwise.

**TABLE 209-2
REQUIREMENTS FOR GRADATION OF AGGREGATE**

Sieve Size	Design Range Percentage by Weight passing		Contractor's Final Gradation	Job Control Grading Band Tolerances ¹ (Percent)
	C-1	D-1		
1-1/2 inch	100			0
1 inch	70-100	100		±5
3/4 inch	60-90	70-100		±8
3/8 inch	45-75	50-80		±8
No. 4	30-60	35-65		±8
No. 8	22-52	20-50		±8
No. 50 ²	6-30	6-30		±5
No. 200 ²	0-5	0-5		±3

¹ The "Job Control Grading Band Tolerances for Contractor's Final Gradation" in the table shall be applied to "Contractor's Final Gradation" to establish a job control grading band. The full tolerance still applies if application of the tolerances results in a job control grading band outside the design range.

² The fraction of material passing the No. 200 sieve shall not exceed two-thirds the fraction passing the No. 50 sieve.

209-2.3 SAMPLING AND TESTING.

- a. **Aggregate base materials.** The Contractor shall take samples of the aggregate base in accordance with ATM 301 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in Subsection 209-2.1. This sampling and testing will be the basis for approval of the aggregate base quality requirements.
- b. **Gradation requirements.** The Contractor shall take at least two aggregate base samples per day in the presence of the Engineer to check the final gradation. Sampling shall be per ATM 301. Material shall meet the requirements in Subsection 209-2.2. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the Engineer.

209-2.4 SEPARATION GEOTEXTILE. Not Used.

CONSTRUCTION METHODS

209-3.1 CONTROL STRIP. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the Engineer, that the materials, equipment, and construction processes meet the requirements of the Specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined.

Control strips that do not meet Specification requirements shall be reworked, re-compacted or removed and replaced at the Contractor's expense. Full operations shall not continue until the control strip has been accepted by the Engineer. The Contractor shall use the same equipment, materials, construction methods, and sequence and manner of rolling for the remainder of base course construction, unless adjustments made by the Contractor are approved by the Engineer.

209-3.2 PREPARING UNDERLYING COURSE. The underlying subgrade and/or subbase shall be checked and accepted, in writing, by the Engineer before base course placing and spreading operations begin. Any ruts or soft, yielding areas shall be corrected and compacted to the required density before the

base course is placed. To ensure proper drainage, the spreading of the base shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope, or as directed by the Engineer.

209-3.3 PRODUCTION. The aggregate shall be uniformly blended and, when at a satisfactory moisture content according to Subsection 209-3.5, the approved material may be transported directly to the spreading equipment. The plant shall blend and mix the materials to meet the Specifications.

209-3.4 PLACEMENT.

The crushed aggregate base material shall be placed on the approved subgrade in uniform, equal-depth layers, each not exceeding 6 inches of compacted depth. The aggregate shall meet gradation and moisture requirements prior to compaction. . Crushed aggregate base course shall not be placed on frozen material.

When more than one lift is required to establish the layer thickness shown on the plans, the construction procedure described here shall apply to each lift. No lift shall be covered by subsequent lifts until tests verify that compaction requirements have been met. The Contractor shall rework, re-compact and retest any material placed which does not meet the Specifications at the Contractor's expense.

209-3.5 COMPACTION. Immediately after completion of the spreading operations, and within the same day that the aggregate is placed, compact each layer of the base course to the required density.

The field density of each compacted lift of material shall be at least 98% of the maximum density of laboratory specimens prepared from samples of the crushed aggregate base material delivered to the jobsite. The laboratory specimens shall be compacted and tested in accordance with ATM 207 or ATM 212. The moisture content of the material during placing operations shall be within ± 2 percentage points of the optimum moisture content as determined by ATM 207 or ATM 212. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

209-3.6 WEATHER LIMITATIONS. Material shall not be placed unless the ambient air temperature is at least 40°F and rising. Work on base course shall not be conducted when the subgrade or subbase is wet or frozen or the base material contains frozen material.

209-3.7 MAINTENANCE. The base course shall be maintained in a condition that will meet all Specification requirements until the work is accepted. Equipment may be routed over completed sections of base course, provided that no damage results and the equipment is routed over the full width of the completed base course to avoid rutting or uneven compaction. Any damage resulting to the base course from routing equipment over the base course shall be repaired by the Contractor at the Contractor's expense.

209-3.8 SURFACE TOLERANCES. After the course has been compacted, the surface will be tested by the Engineer for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches, reshaped and recompact to grade until the required smoothness and accuracy are obtained and approved by the Engineer. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

- a. **Smoothness.** The finished surface shall not vary more than 3/8-inch when tested with a 12-foot straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot straightedge for the full length of each line on a 50-foot grid.
- b. **Grade.** The grade and crown shall be measured on a 50-foot grid and shall be within +0 and -1/2 inch of the specified grade.

209-3.9 ACCEPTANCE SAMPLING AND TESTING. Crushed aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for each 1200 square yards. Sampling locations will be determined on a random basis according to ATM SP 4.

- a. **Density.** The Engineer will perform all density tests. Base course will be accepted for density when the field density is not less than 98% of the maximum density, as determined according to ATM 207 or ATM 212. The in-place field density and moisture content will be determined according to ATM 213. If the specified density is not attained, the material shall be reworked and/or recompacted until the specified density is reached.
- b. **Thickness.** The thickness of the finished base course will be determined by the Engineer by taking before and after elevation measurements, or by depth tests, at random locations. The completed thickness of the base course shall be within 1/2 inch of the design thickness. Where the thickness is deficient by more than 1/2 inch, the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches, adding new material of proper gradation, and the material shall be blended and recompacted to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken.

METHOD OF MEASUREMENT

209-4.1 The quantity of crushed aggregate base course will be determined by the ton or measured by the cubic yard of material in final position according to Subsection 90-02.

BASIS OF PAYMENT

209-5.1 Payment shall be made at the contract unit price per unit of measurement, accepted in place.

Payment will be made under:

Item P209.010.0000	Crushed Aggregate Base Course - per cubic yard
Item P209.020.0000	Crushed Aggregate Base Course - per ton
Item P209.030.0000	Crushed Aggregate Base Course Stockpile – per ton
Item P209.070.0000	Base Course Reconditioning – per square yard

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AASHTO T 96	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
AASHTO T 104	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
AASHTO T 327	Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus
ATM 204	WAQTC FOP for AASHTO T 89 Determining the Liquid Limit of Soils
ATM 205	WAQTC FOP for AASHTO T 90 Determining the Plastic Limit and Plasticity Index of Soils
ATM 207	WAQTC FOP for AASHTO T 99/ T 180 Moisture-Density Relations of Soils
ATM 212	Determining the Standard Density of Coarse Granular Materials Using the Vibratory Compactor

ATM 213	WAQTC FOP for AASHTO T 310 In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)*
ATM 301	WAQTC FOP for AASHTO T 2 Sampling of Aggregates
ATM 304	WAQTC FOP for AASHTO T 27/T 11 Sieve Analysis of Fine and Coarse Aggregates *
ATM 305	WAQTC FOP for AASHTO T 335 Determining the Percentage of Fracture in Coarse Aggregate*
ATM 306	Determining the Percentage of Flat and Elongated Particles in Coarse Aggregate
ATM SP 4	Random Sampling

ITEM P-299 AGGREGATE SURFACE COURSE

DESCRIPTION

299-1.1 This item consists of an aggregate surface course composed of crushed or uncrushed coarse aggregate bonded with either soil or fine aggregate or both. It shall be constructed on a prepared course according to these Specifications and to the dimensions and typical cross section shown on the Plans.

MATERIALS

299-2.1 GENERAL. Aggregates shall consist of hard, durable particles or fragments of stone or gravel mixed or blended with sand, stone dust, or other similar binding or filler materials produced from approved sources. The aggregate shall be free from vegetation, lumps, or excessive amounts of clay and other objectionable substances. The coarse aggregate shall have a maximum Micro-Deval value of ___% when tested according to AASHTO T 327. The aggregate shall have a percent of wear not more than 50 at 500 revolutions as determined by AASHTO T 96 and shall not show evidence of disintegration nor show loss greater than 12% when subjected to 5 cycles of sodium sulfate accelerated soundness test using AASHTO T 104.

- a. Crushed Aggregate Surface Course.** The aggregates shall consist of both fine and coarse fragments of crushed stone or crushed gravel mixed or blended with sand, screenings, or other similar approved materials. The material shall consist of hard, durable particles or fragments of stone and shall be free from excess soft or disintegrated pieces, dirt, or other objectionable matter.

The fractured particles in the finished product shall be as uniform as practicable. At least 75% by weight of material retained on the No. 4 sieve shall have one or more fractured faces, when tested according to ATM 305.

If necessary to meet this requirement, or to eliminate an excess of fine, uncrushed particles, the gravel shall be screened before crushing.

The fine, aggregate portion, defined as the portion passing the No. 4 sieve, produced in crushing operations, shall be incorporated in the base material to the extent permitted by the gradation requirements.

- b. Uncrushed Aggregate Surface Course.** This material may consist of natural pit-run aggregate. However, screening, blending, ripping, washing, and/or necessary mixing of the material or other processing may be necessary to meet the gradation and performance requirements of this specification.

299-2.2 GRADATION. The gradation of the uncrushed or crushed material shall meet the requirements of the gradations indicated in Table 1, when tested according to ATM 304.

**TABLE 1
AGGREGATE GRADATION REQUIREMENTS**

Sieve Designation(Square Openings)	Percentage by weight passing sieves For E-1
1.0 in.	100
3/4 in.	70-100
3/8 in.	50-85
No. 4	35-65
No. 8	20-50
No. 50	15-30
No. 200	8-15

The specified gradations represent the limits of suitability of aggregate for use from the sources of supply. The final gradations decided on, within the specified limits, shall be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieves, or vice versa.

The portion of the material passing the No. 40 sieve shall have a liquid limit not more than 35 and a plasticity index not more than 10, when tested according to ATM 204 and ATM 205.

299-2.3 FINES FOR BLENDING. If additional fine material is necessary, it shall be obtained from approved sources and uniformly blended with the aggregate at the crushing plant, the mixing plant, or as approved by the Engineer. Silt, stone dust, or other similar fine material may be used as binder.

CONSTRUCTION METHODS

299-3.1 (RESERVED).

299-3.2 PREPARING UNDERLYING COURSE. The underlying course will be checked and accepted by the Engineer before placing and spreading operations are started. Any ruts or soft areas shall be corrected and compacted to the required density before placing aggregate surface course.

To protect the underlying course and to ensure proper drainage, the spreading of the aggregate surface course shall begin along the centerline on a crowned section or on the high side of sections with a one-way slope.

299-3.3 METHODS OF PRODUCTION. The aggregate shall be uniformly blended and when at the satisfactory moisture content per paragraph 299-3.5, the approved material may be transported directly to the spreading equipment.

299-3.4 PLACING. The surface course shall be constructed without segregation of the aggregate. The material shall be placed in uniform, equal-depth layers, each not exceeding 6 inches of compacted depth. No material shall be placed in snow or on a soft uncompact, muddy, or frozen course.

During the mixing and spreading process, sufficient caution shall be exercised to prevent the incorporation of subgrade, subbase, or shoulder material in the surface course mixture.

299-3.5 COMPACTION. Immediately upon completion of the spreading operations, the aggregate shall be thoroughly compacted to the required density. The moisture content of the material shall be ± 2 percentage points of the optimum moisture content.

299-3.6 ACCEPTANCE SAMPLING AND TESTING FOR DENSITY. The surface course will be accepted for density when the field density is not less than 95% of the maximum density, as determined according to ATM 207, ATM 212, or ATM 309. The control strip for ATM 309 shall be compacted by a vibratory compactor with a minimum operating weight of 22,000 pounds. The in-place field density and moisture content will be determined according to ATM 213. If the specified density is not attained, the material shall be reworked and/or recompact until the specified density is reached.

299-3.7 FINISHING. The surface of the aggregate surface course shall be finished by blading or with automated equipment specifically designed for this purpose.

In no case shall thin layers of material be added to the top of surface course to meet grade. If the compacted elevation of the top layer is 0.05 foot or more below grade, it shall be scarified to a depth of at least 3 inches, new material added, and the layer shall be blended and compacted to bring it to grade. If the finished surface is above plan grade, it shall be cut back to grade and recompact.

299-3.8 SURFACE TEST. After the course has been completely compacted, the surface will be tested by the Engineer for smoothness and accuracy of grade and crown. The finished grade elevation shall not vary more than 0.05 foot from the design elevation. The finished surface shall not vary more than 3/8 inch from a 12-foot straightedge when applied to the surface parallel with, and at right angles to, the centerline. Any

portion lacking the required smoothness or failing in accuracy of grade or crown shall be corrected to within the specified tolerances and approved by the Engineer.

299-3.9 PROTECTION. Work on the surface course shall not be accomplished during freezing temperatures or when the subgrade is wet. When the aggregates contain frozen materials or when the underlying course is frozen, the construction shall be stopped.

Hauling equipment may be routed over completed portions of the surface course, provided no damage results and provided that such equipment is routed over the full width of the surface course to avoid rutting or uneven compaction. However, the Engineer in charge will have full and specific authority to stop all hauling over completed or partially completed surface course when, in their opinion, such hauling is causing damage. Any damage resulting to the surface course from routing equipment over the surface course shall be repaired by the Contractor at their own expense.

299-3.10 MAINTENANCE. Following the completion of the aggregate surface course, the Contractor shall satisfactorily remove all blue tops, fill and compact the voids, and perform all maintenance work on this surface until final acceptance unless otherwise stated in the Specifications. The surface course shall be properly drained at all times.

METHOD OF MEASUREMENT

299-4.1 Aggregate Surface Course will be weighed by the ton or measured by the cubic yard in final position according to GCP Subsection 90-02.

BASIS OF PAYMENT

299-5.1 Aggregate Surface Course will be paid for at the contract price, per unit of measurement, accepted in place.

Payment will be made under:

Item P299.010.0000	Crushed Aggregate Surface Course – per cubic yard
Item P299.020.0000	Crushed Aggregate Surface Course – per ton
Item P299.030.0000	Crushed Aggregate Surface Course – per contingent sum
Item P299.040.0000	Uncrushed Aggregate Surface Course – per cubic yard

REFERENCES

AASHTO T 96	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
AASHTO T 104	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
AASHTO T 327	Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus
ATM 204	WAQTC FOP for AASHTO T 89 Determining the Liquid Limit of Soils
ATM 205	WAQTC FOP for AASHTO T 90 Determining the Plastic Limit and Plasticity Index of Soils
ATM 207	WAQTC FOP for AASHTO T 99/ T 180 Moisture-Density Relations of Soils
ATM 212	Determining the Standard Density of Coarse Granular Materials using the Vibratory Compactor
ATM 213	WAQTC FOP for AASHTO T 310 In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

ATM 304	WAQTC FOP for AASHTO T 27/T 11 Sieve Analysis of Fine and Coarse Aggregates
ATM 305	WAQTC FOP for AASHTO T 335 Determining the Percentage of Fracture in Coarse Aggregate
ATM 309	Relative Standard Density of Soils by the Control Strip Method

ITEM P-401 ASPHALT MIX PAVEMENT

DESCRIPTION

401-1.1 ASPHALT MIX PAVEMENT. Hot Mix Asphalt (HMA) shall consist of pavement courses composed of mineral aggregate and asphalt binder mixed in a central mixing plant and placed on a prepared base or stabilized course in accordance with these Specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the Plans. Each course shall be constructed to the depth, typical section, and elevation required by the Plans and shall be rolled, finished, and approved before the placement of the next course.

MATERIALS

401-2.1 AGGREGATE. Aggregates shall consist of crushed stone, crushed gravel, crushed slag, screenings, natural sand, and mineral filler, as required. The aggregates should have no known history of detrimental pavement staining due to ferrous sulfides, such as pyrite. Coarse aggregate is the material retained on the No. 4 sieve. Fine aggregate is the material passing the No. 4 sieve.

Use a minimum of three stockpiles of crushed aggregate of different gradations. Place blend material, if any, in a fourth pile.

- a. **Coarse Aggregate.** Coarse aggregate shall consist of sound, tough, durable particles, free from films of matter that would prevent thorough coating and bonding with the bituminous material and be free from organic matter and other deleterious substances. Coarse aggregate material shall conform to Table 401-1 Coarse Aggregate Material Requirements.

TABLE 401-1. COARSE AGGREGATE MATERIAL REQUIREMENTS

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% maximum	AASHTO T 96
Soundness of Aggregates by Use of Sodium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate	AASHTO T 104
Clay lumps and friable particles	1.0% maximum	AASHTO T 112
Micro-Deval	18% maximum	AASHTO T 327
Percentage of Fractured Particles	For pavements designed for aircraft gross weights of 60,000 pounds or more: Minimum 90% by weight of particles with at least two fractured faces, except Type V shall have a minimum of 98% by weight with at least two fractured faces	ATM 305
	For pavements designed for aircraft gross weights less than 60,000 pounds (27200 kg): Minimum 50% by weight of particles with at least two fractured faces and 65% with at least one fractured face ¹	
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 ²	ATM 306

^{1.} The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

^{2.} A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

- b. Fine Aggregate.** Fine aggregate shall consist of clean, sound, tough, durable, angular shaped particles produced by crushing stone, slag, or gravel and shall be free from coatings of clay, silt, or other objectionable matter, and conform to Table 401-2 Fine Aggregate Material Requirements.

Natural (non-manufactured) sand may be used to obtain the gradation of the fine aggregate blend or to improve the workability of the mix. The amount of sand to be added will be adjusted to produce mixtures conforming to requirements of these Specifications.

TABLE 401-2. FINE AGGREGATE MATERIAL REQUIREMENTS

Material Test	Requirement	Standard
Liquid limit	25 maximum	ATM 204
Plasticity Index	4 maximum	ATM 205
Soundness of Aggregates by Use of Sodium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate	AASHTO T 104
Clay Lumps and Friable Particles	1.0% maximum	AASHTO T 112
Sand Equivalent	45 minimum	ATM 307
Natural Sand	15% maximum by weight of total aggregate	ASTM D1073
Uncompacted Void Content ¹	45% minimum	AASHTO T 304, Method A

¹. Applies to Type V mix designs.

- c. Sampling.** The Engineer will sample according to ATM 301 for coarse and fine aggregate and according to ASTM D242 for mineral filler.

401-2.2 MINERAL FILLER. Mineral filler (baghouse fines) may be added in addition to material naturally present in the aggregate. Mineral filler shall meet the requirements of AASHTO M 17 and Table 401-3.

TABLE 401-3. MINERAL FILLER REQUIREMENTS

Material Test	Requirement	Standard
Plasticity Index	4 maximum	ATM 205

401-2.3 ASPHALT BINDER. Provide the asphalt binder performance grade as indicated on the Plans. Asphalt binder shall conform to AASHTO M 320 or M 332 for the specified Performance Grade, except as indicated in Table 401-4 Exceptions to Performance-Graded Asphalt Binder Specification.

TABLE 401-4. EXCEPTIONS TO PERFORMANCE-GRADED ASPHALT BINDER SPECIFICATION

Performance Grade	AASHTO Spec.	Viscosity AASHTO T 316	MSCR, AASHTO T 350			PAV, Dynamic Shear AASHTO T 315	Direct Tension AASHTO T 314
			JNR _{3.2} kPa ⁻¹	JNR Diff	% Rec _{3.2}		
PG 52-28	M320	None	---	---	---	None	Delete
PG 52-40	M320	None	---	---	---	None	Delete
PG 52-40V	M332	None	0.50 max.	Delete	75 min.	None	Delete
PG 58-34E	M332	None	0.25 max.	Delete	85 min.	None	Delete
PG 64-40E	M332	1.0 PaS max.	0.10 max.	Delete	95 min.	5000 max @ 4°C	Delete

The Contractor shall furnish vendor's certificate of compliance and certified test reports for each lot of asphalt binder shipped to the project. The vendor's certified test report for the asphalt binder can be used for acceptance or tested independently by the Engineer.

The following documents shall be furnished at delivery:

- a. Manufacturer's certificate of compliance
- b. Certified test reports for the lot.
- c. Lot number, storage tanks, and shipping containers (if applicable) used.
- d. Date and time of load out for delivery.
- e. Type, grade, temperature, and quality of asphalt binder loaded.
- f. Type and percent of anti-stripping agent added.

All excess asphalt binder shall remain the property of the Contractor. Removal of excess asphalt binder from the project area shall be incidental to the contract and no separate payment will be made.

401-2.4 ANTI-STRIPPING AGENT. Any anti-stripping agent or additive (anti-strip) shall be heat stable and shall not change the asphalt binder grade beyond Specifications. Anti-strip shall be approved by the Engineer.

401-2.5 PRELIMINARY MATERIAL ACCEPTANCE. Prior to delivery of materials to the job site, the Contractor shall submit certified test reports to the Engineer for the following materials:

- a. Coarse Aggregate.
 - (1) Percent of wear
 - (2) Soundness
 - (3) Degradation
 - (4) Percent of fracture
 - (5) Percent of flat and elongated particles
 - (6) Clay lumps and friable particles
- b. Fine Aggregate.
 - (1) Liquid limit.
 - (2) Plasticity index
 - (3) Sand equivalent
 - (4) Un-compacted void content for HMA Type V
 - (5) Clay lumps and friable particles
 - (6) Soundness
 - (7) Percent Natural Sand
- c. Mineral Filler.

- (1) Gradation
- (2) Plasticity Index
- (3) Organic content

d. Asphalt Binder. The certification(s) shall show the appropriate test(s) for each material, the test results, and a statement that the material meets the specification requirement. Include temperature/viscosity charts and note recommended mixing and compaction temperatures.

401-2.6 JOINT ADHESIVE. The joint adhesive shall conform to Table 401-5 Joint Adhesive Material Requirements.

TABLE 401-5. JOINT ADHESIVE MATERIAL REQUIREMENTS

PROPERTY	SPECIFICATION	TEST METHOD
Brookfield Viscosity, 400°F	4,000 – 11,000 cP	ASTM D2669
Core Penetration, 77°F Flow, 140°F Resilience, 77°F Tensile Adhesion, 77°F Asphalt Compatibility	60 – 100 0.2-inch, max. 30%, min. 500%, min. Pass	ASTM D5329
Ductility, 77°F Ductility, 39.2°F	1-foot, min. 1-foot, min.	ASTM D113
Softening Point	170°F	AASHTO T 53

401-2.7 JOINT SEALANT. The joint shall be sealed with GSB 88 (manufactured by Asphalt Systems Inc.), Optipave (manufactured by SealMaster), or meet the following:

- a. Emulsion concentrate, in the undiluted state, shall have the following properties:
 - (1) Saybolt furol viscosity at 77°F, ASTM D244, seconds 20-100
 - (2) Residue by distillation or evaporation, ASTM D244, % 57 min
 - (3) Sieve test, ASTM D244, % 0.2 max
 - (4) 5 day Settlement test, ASTM D244, % 5.0 max
 - (5) Particle charge (refer to 401-2.7d), ASTM D244 Positive
- b. Ready to Apply:
 - (1) Emulsion concentrate diluted in the proportion of one part emulsion to one part hot water by volume, shall have the following properties:
 - (a) Saybolt furol viscosity at 77°F, ASTM D244, seconds 10-50
 - (b) Residue by distillation or evaporation, ASTM D244, % 28.5 min
 - (c) Pumping stability test, (refer to 401-2.7e) Pass
 - (2) Emulsion concentrate diluted in the proportion of two parts emulsion to one part hot water by volume, shall have the following properties:
 - (a) Saybolt furol viscosity at 77°F, ASTM D244, seconds 10-50

- (b) Residue by distillation or evaporation, ASTM D244, % 37.5 min
- (c) Pumping stability test, (refer to 401-2.7e) Pass
- c. Tests on residue from distillation or evaporation shall have the following properties:
 - (1) Viscosity at 275°F, ASTM D4402, cubic feet per second (cts).....1,750 max
 - (2) Solubility in 1,1,1 Trichloroethylene, ASTM D2042, %.....97.5 min
 - (3) Penetration ASTM D5, dmm.....50 max
 - (4) Asphaltenes, ASTM D2007,% 15 min
 - (5) Saturates, ASTM D2007, % 15 max
 - (6) Polar Compounds, ASTM D2007, %25 min
 - (7) Aromatics, ASTM D2007, %..... 15 min
- d. pH may be used in lieu of the particle charge test, which is sometimes inconclusive in slow setting, bituminous emulsions.
- e. Pumping stability test is tested by pumping one pint of sealer material diluted one part concentrate to one part water, at 77°F, through a 1/4-inch gear pump operating 1,750 revolutions per minute (rpm) for 10 minutes with no significant separation or coagulation.

The bituminous base residue shall contain not less than 20% gilsonite, and shall not contain any tall oil pitch. Curing time, under recommended application conditions, shall not exceed four hours. The Contractor shall furnish and submit to the Engineer, manufacturer's certification that the material is the type, grade, and quality specified for each load of bituminous material delivered. The certification shall show the shipment number, refinery, consignee, destination, contract number, and date of shipment. The Contractor shall submit to the Engineer, two 1-quart samples of ready-to-apply bituminous material for each batch applied and two 1-quart samples of concentrate for each load delivered. The Contractor shall submit any additional samples requested by the Engineer.

The Engineer may request samples for testing, prior to and during production, to verify the quality of the materials and to ensure conformance with the applicable Specifications.

COMPOSITION

401-3.1 COMPOSITION OF MIXTURE(S). The HMA shall be composed of a mixture of well-graded aggregates, filler, if required, and asphalt binder. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix design (JMD).

401-3.2 JOB MIX DESIGN (JMD) LABORATORY. The laboratory used to develop the JMD shall possess a current certificate of accreditation, listing ASTM D3666 from a national accrediting authority, and all test methods required for developing the JMD; and be listed on the accrediting authority's website. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Department prior to start of construction.

401-3.3 JOB MIX DESIGN (JMD). No HMA for payment shall be placed until an acceptable JMD has been approved by the Engineer. The Class A and B HMA shall be designed using procedures contained in ATM 417, and shall meet the requirements of Tables 401-6 and 401-8.

The HMA, Type V, Class S will be designed using procedures contained in AASHTO R 35 and shall meet the requirements of Table 401-7 and Table 401-8. Upon completion of the JMD, determine the Marshall

stability and Marshall air voids at the design asphalt binder content using a 75-Blow Marshall from procedures contained in ATM 417. The Department will furnish all JMDs for HMA, Type V.

The JMD and subsequent production targets should be based on a stability greater than shown in Table 401-6 and 401-7, and the flow and air voids should be targeted close to the mid-range of the criteria in order to meet the acceptance requirements.

Anti-stripping agent shall be added to the asphalt binder in the amount determined by ATM 414. A minimum of 0.30% anti-stripping agent by weight of asphalt binder is required.

At the discretion of the Engineer, the JMD may be designed by the Department. The Department designed JMDs will be based on the Contractor's submitted target gradation. The Contractor shall submit material samples to the Engineer, upon request, for JMD. The Department will bear the cost of the initial JMD evaluation for each Type and Class of HMA specified. If subsequent evaluations are required, the Engineer will assess a fee of \$5,000.00 under Hot Mix Asphalt Price Adjustment, for each additional evaluation.

- a. **DEPARTMENT FURNISHED JMD.** Submit the following, or as directed, in writing to the Engineer at least 30 calendar days prior to the start of paving operations and shall include as a minimum:
 - (1) Manufacturer's Certificate of Analysis (COA) for the asphalt binder used in the JMD according to subsection 401-2.3. Certificate of asphalt Performance Grade must include added modifier, if used, and also indicate compliance of asphalt binder with AASHTO M 320 or AASHTO M 332. Furnish five (5) separate 1-gallon samples of the asphalt binder proposed for use in the HMA, and Safety Data Sheet.
 - (2) Manufacturer's Certificate of Analysis (COA) for the anti-stripping agent if used in the JMD according to subsection 401-2.4.
 - (3) Certified material test reports for the course and fine aggregate and mineral filler according to subsection 401-2.1.
 - (4) Percent natural sand.
 - (5) Percent fractured faces.
 - (6) Percent by weight of flat particles, elongated particles, and flat and elongated particles (and criteria).
 - (7) Laboratory mixing and compaction temperatures.
 - (8) Supplier-recommended field mixing and compaction temperatures.
 - (9) Plot of the combined gradation on a 0.45 power gradation curve. Provide curve and testing results for each aggregate type proposed for use.
 - (10) Type and amount of anti-strip agent when used. Furnish a minimum of 1/2-pint of the proposed anti-strip additive, if anti-strip is not incorporated into asphalt binder by the manufacturer.
 - (11) Temperature-viscosity relationship of the asphalt binder.
 - (12) Uncompacted void content for HMA Type V.
 - (13) Percentage and properties (asphalt content, asphalt binder properties, and aggregate properties) of RAP in accordance with subsection 401-3.4. Furnish 200-pound, minimum, sample of proposed RAP.

- b. CONTRACTOR FURNISHED JMD.** When the Contractor is directed to prepare the JMD for approval, the Contractor must submit the JMD sealed by the responsible Professional Engineer of the laboratory.

In addition to the items listed in subsection 401-3.3a, submit the following, or as directed, in writing to the Engineer at least 15 calendar days prior to the start of paving operations:

- (1) Date the JMD was developed. Mix designs that are not dated or which are from a prior construction season will not be accepted.
- (2) Percent passing each sieve size for individual gradation of each aggregate cold feed and/or hot bin; percent by weight of each cold feed and/or hot bin used; and the total combined gradation in the JMD. Furnish representative samples totaling 500 pounds of aggregate material in proportional amounts to the proposed JMD.
- (3) A letter stating the location, size, and type of mixing plant. The letter shall include gradations for individual stockpiles, and the blend ratio of each aggregate stockpile.
- (4) Specific Gravity and absorption of each coarse and fine aggregate.
- (5) Percent of asphalt.
- (6) Number of blows or gyrations.
- (7) Asphalt Pavement Analyzer (APA), or Hamburg test results; or stability and flow test results, as appropriate for the mix design method.
- (8) Sand Equivalent value for fine aggregate.
- (9) Theoretical Maximum Specific Gravity at the optimum asphalt binder content.

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

The Engineer has authority to review and reject submitted JMDs that do not meet these Specifications. The Contractor shall submit samples to the Engineer, upon request, for JMD verification testing.

The JMD for each mixture shall be in effect until modified in writing by the Engineer. Should a change in sources of materials be made, a new JMD must be approved by the Engineer before the new material is used.

TABLE 401-6. MARSHALL MIX DESIGN REQUIREMENTS

Test Property	Class A: Pavements Designed for Aircraft Gross Weights of 60,000 lbs or More or Tire Pressures of 100 psi or More	Class B: Pavements Designed for Aircraft Gross Weight Less Than 60,000 lbs or Tire Pressure Less Than 100 psi
Number of blows	75	50
Stability, pounds	2150	1350
Flow, 0.01 inch ¹	10-16	10-18
Air voids % (design target 3.5%)	2.8 – 4.2	2.8 – 4.2
Voids in mineral aggregate, %, min.	See Table 401-8	See Table 401-8

Test Property	Class A: Pavements Designed for Aircraft Gross Weights of 60,000 lbs or More or Tire Pressures of 100 psi or More	Class B: Pavements Designed for Aircraft Gross Weight Less Than 60,000 lbs or Tire Pressure Less Than 100 psi
Asphalt Binder Content, %, min.	5.0	5.0
Antistrip Requirement, % coverage, min ²	70	70
Asphalt Pavement Analyzer (APA) ³	Less than 10mm @ 4,000 passes	N/A

¹. The flow requirement is not applicable for Polymer Modified Asphalts.

². ATM 414 ³. ATM 419 at 250 psi hose pressure at 64°C test temperature

TABLE 401-7. GYRATORY HOT MIX ASPHALT TYPE V MIX DESIGN REQUIREMENTS

Mix Design Class S	
Pavements for gross aircraft weights of 60,000 lbs or more.	
Test Property	Design Criteria ^{3/4} " Nominal Maximum Aggregate Size
Initial Number of Gyration (N _{ini})	7
Design Number of Gyration (N _{des})	75
Maximum Number of Gyration (N _{max})	115
Air voids @ N _{des} (Design Target 3.5), %	2.8-4.2
Voids in Mineral Aggregate @ N _{des} , %	Table 401-8
Voids filled with Asphalt @ N _{des} , %	65-78
Dust to effective asphalt ratio	0.6 -1.2
Uncompacted Void Content	45 min.
% G _{mm} @ N _{ini}	≤ 90.50
% G _{mm} @ N _{max}	≤ 98.00
Asphalt Binder Content, %, min.	5.0
Antistrip Requirement, %, min. ¹	70
Marshall Stability 75 blow (average of 3 specimens)	Report
Marshall Air Voids – 75 blow (average of 3 specimens)	Report
Rut Index, Max., mm, ATM 419 ²	Less than 10 mm @ 4,000 passes

¹. ATM 414

². ATM 419 at 250 psi hose pressure at 64°C test temperature

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 401-8 Aggregate-Asphalt Pavements when tested according to ATM 304. The maximum size aggregate used shall not be more than one-fourth of the thickness of the course being constructed.

The gradations in Table 401-8 represent the limits that shall determine the suitability of aggregate for use from the sources of supply. The aggregate, as selected (and used in the JMD), shall have a gradation within the limits designated in Table 401-8 and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa, but shall be well graded from coarse to fine when tested according to ATM 304.

The aggregate gradations shown are based on aggregates of uniform specific gravity. The percentages passing the various sieves shall be corrected when aggregates of varying specific gravities are used, as indicated in the Asphalt Institute MS-2 Mix Design Manual, 7th Edition.

TABLE 401-8. AGGREGATE – ASPHALT PAVEMENTS

Sieve Size	Percentage by Weight Passing Sieves			Type V
	Type I	Type II	Type III ¹	
1 inch	100	--	--	--
3/4 inch	90-100	100	--	100
1/2 inch	68-88	90-100	100	65-90
3/8 inch	60-82	72-88	90-100	55-80
No. 4	45-67	53-73	58-78	40-60
No. 8	32-54	38-60	40-60	≤ 45
No. 16	22-44	26-48	28-48	≤ 35
No. 30	15-35	18-38	18-38	≤ 25
No. 50	9-25	11-27	11-27	≤ 20
No. 100	6-18	6-18	6-18	≤ 12
No. 200	3-6	3-6	3-6	4-7
Minimum Voids in Mineral Aggregate (VMA)	13	14	15	14
Asphalt percent by total weight of mixture:				
Stone or gravel	4.5-7.0	5.0-7.5	5.5-8.0	5.0 – 7.5
Recommended Minimum Construction Lift Thickness	3 inches	2 inches	1-1/2 inches	2 inches

¹ Type III gradation is intended for leveling courses.

401-3.4 RECYCLED HOT MIX ASPHALT PAVEMENT. Recycled HMA shall consist of reclaimed asphalt pavement (RAP), coarse aggregate, fine aggregate, mineral filler, asphalt binder, and recycling agent, if necessary. The RAP shall be of a consistent gradation and asphalt content and properties. When RAP is fed into the plant, the maximum RAP size shall not exceed one inch. The recycled HMA shall be designed using procedures contained in the Asphalt Institute MS-2 Mix Design Manual, 7th Edition, in conjunction with ATM 417. The percentage of asphalt in the RAP shall be established for the mix design according to ASTM D2172 using the appropriate dust correction procedure. The JMD shall meet the requirements subsection 401-3.3. Recycled HMA shall only be used for shoulder surface course mixes and for any intermediate courses. The amount of RAP shall be limited to 20 percent. In addition to the requirements of subsection 401-3.3, the JMD shall indicate the percent of RAP, the percent and grade of new asphalt binder, the percent and grade of hot mix recycling agent (if used), and the properties (including viscosity and penetration) of the asphalt blend. The resulting composite mixture of RAP and virgin components shall meet all requirements specified for mixes without RAP. No RAP shall be used in Type V, Class S HMA.

RAP containing Coal Tar shall not be used. Coal Tar surface treatments must be removed prior to recycling underlying asphalt material. Recycled asphalt shingles (RAS) shall not be used.

All new aggregates used in the recycled mix shall meet the requirements of subsection 401-2.1. New asphalt binder shall meet the requirements of subsection 401-2.3. Recycling agents shall meet the requirements of ASTM D4552. The Contractor shall submit documentation to the Engineer, indicating that the mixing equipment proposed for use is adequate to mix the percent of RAP shown in the JMD.

401-3.5 CONTROL STRIP. Full production shall not begin until an acceptable control strip has been constructed and accepted in writing by the Engineer. The Contractor shall prepare and place a quantity of asphalt according to the JMD. The underlying grade or pavement structure upon which the control strip is to be constructed shall be the same as the remainder of the course represented by the control strip.

The Contractor will not be allowed to place the control strip until the Contractor Quality Control Program (CQCP), showing conformance with the requirements of subsection 401-5.1, has been accepted, in writing, by the Engineer.

The control strip will consist of at least 250 tons. The control strip shall be placed in two lanes of the same width and depth to be used in production with a longitudinal cold joint. The cold joint must be cut back in accordance with subsection 401-4.14 using the same procedure that will be used during production. The cold joint for the control strip will be an exposed construction joint at least four (4) hours old or when the mat has cooled to less than 160°F. The equipment used in construction of the control strip shall be the same type, configuration, and weight, to be used on the project.

The control strip shall be evaluated for acceptance as a single lot in accordance with the acceptance criteria in subsection 401-6.1 for aggregate gradation and asphalt binder content. The control strip shall be divided into three separate equal sub-lots. If the Composite Pay Factor is less than 1.000, the control strip is unacceptable.

Three 6-inch diameter core samples shall be cut from the finished hot mix asphalt by the Contractor, at the locations marked by the Engineer. The core samples will be tested by the Department for density according to subsection 401-5.1. The Target Value for mat density is 94.0% of the theoretical maximum specific gravity (MSG) of the JMD. The three samples will be evaluated according to subsection 401-8.1.a. If the Density Pay Factor is less than 1.000, the control strip is unacceptable.

Three longitudinal joint cores centered on the longitudinal joint shall be cut by the Contractor, at the locations marked by the Engineer. The core samples will be tested by the Department according to subsection 401-5.1. The Target Value for joint density is 92.0% of the JMD MSG. If the average density of the three joint cores is below 91.0%, the control strip is unacceptable.

After completion of control strip compaction, the Department will accept or reject the control strip within 48 hours.

If the control strip is unacceptable, necessary adjustments to the JMD, plant operation, placing procedures, and/or rolling procedures shall be made and another control strip shall be placed. Unacceptable control strips shall be removed at the Contractor's expense. For small projects, less than 3,000 tons, a control strip is not required.

401-3.6 PRE-PAVING CONFERENCE. Meet with the Engineer for a pre-paving meeting in the presence of project superintendent and paving foreman at least five working days before beginning paving operations. Submit a paving plan and pavement inspection plan per 401-3.7, 24 hours before the pre-paving conference.

Include the following elements in the paving plan and address these elements at the meeting:

- a. Safety Plan procedures to be implemented prior to and during paving.
- b. Sequence of operations and Laydown Plan per subsection 401-4.11.
- c. List of equipment that will be used for production, transport, pick-up (if applicable), laydown, and compaction.
- d. Summary of plant modifications (if applicable) for production of HMA.
- e. Procedures to produce consistent HMA.
- f. Procedures to minimize material and thermal segregation.
- g. Procedures to minimize premature cooling.
- h. Procedures to achieve HMA density.

- i. Procedures for joint construction including corrective action for joints that do not meet surface tolerance requirements.
- j. Quality control sampling and testing methods, frequencies and sample locations for gradation, asphalt binder content, and density.
- k. Any other information or procedures necessary to provide completed HMA construction that meets the contract requirements.

Include the following elements in the pavement inspection plan and address these elements at the meeting:

- l. Process for daily inspections
- m. Means and methods to remove and dispose of project materials

401-3.7 PROJECT MAINTENANCE. Inspect daily according to pavement inspection plan. Remove, and dispose of project materials incorrectly deposited on existing and new pavement surface(s) inside and outside the project area including haul routes.

The Contractor is responsible for damage caused by not removing these materials and any damage to the roadway from the removal method(s).

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

CONSTRUCTION METHODS

401-4.1 WEATHER LIMITATIONS. The HMA shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 401-9. The temperature requirements may be waived by the Engineer, if requested; however, all other requirements including compaction shall be met.

Table 401-9. Surface Temperature Limitations of Underlying Course

Mat Thickness	Base Temperature (°F Minimum)
3 inches or greater	40
Greater than 2 inches but less than 3 inches	45

401-4.2 ASPHALT MIXING PLANT. Meet American Association of State Highway and Transportation Officials (AASHTO) M 156. Use an HMA plant capable of producing at least 250 tons of HMA per hour noted on posted DEC air quality permit, designed to dry aggregates, maintain consistent and accurate temperature control, and accurately proportion asphalt binder and aggregates. HMA plant capacity to support echelon paving shall be a minimum of 400 tons per hour produced by a maximum of 2 plants. Both plants shall produce the same mix design. Calibrate the HMA plant and furnish copies of the calibration data to the Engineer at least 24 hours before HMA production.

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

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

Plants may not be placed on Airport property unless a specific location is noted on the Plans. Requirements for all plants include:

- a. **Inspection of Plant.** The Engineer, or Engineer's authorized representative, shall have access, at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant; verifying weights, proportions, and material properties; and checking the temperatures maintained in the preparation of the mixtures.
- b. **Storage Bins and Surge Bins.** Use of surge bins or storage bins for temporary storage of HMA will be permitted as follows:
 - (1) The HMA may be stored in surge bins for not longer than 3 hours.
 - (2) The HMA may be stored in insulated storage bins for not longer than 8 hours.

The bins shall be such that mix drawn from them meets the same requirements as mix loaded directly into trucks.

If the Engineer determines that there is an excessive amount of heat loss, segregation or oxidation of the mixture due to temporary storage, no temporary storage will be allowed.

401-4.3 AGGREGATE STOCKPILE MANAGEMENT. Aggregate stockpiles shall be constructed in a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the asphalt batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used. A continuous supply of materials shall be provided to the work to ensure continuous placement.

401-4.4 HAULING EQUIPMENT. Trucks used for hauling HMA shall have tight, clean, and smooth metal beds. To prevent the mixture from sticking to the truck beds, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other material approved by the RPR. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

401-4.4.1 MATERIAL TRANSFER VEHICLE (MTV). MTVs used to transfer the material from the hauling equipment to the paver shall be self-propelled, with a swing conveyor that can deliver material to the paver without making contact with the paver. The MTV shall be able to move back and forth between the hauling equipment and the paver providing material transfer to the paver, while allowing the paver to operate at a constant speed. The MTV will have remixing and storage capability of at least 15 tons to prevent physical and thermal segregation.

401-4.5 ASPHALT PAVERS. HMA pavers shall be self-propelled with an activated heated screed, capable of spreading and finishing courses of bituminous plant mix material that will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface. The asphalt paver shall be equipped with a control system capable of automatically maintaining the specified screed grade and elevation.

If the spreading and finishing equipment in use leaves tracks or indented areas, or produces other blemishes in the pavement that are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued.

The paver shall be capable of paving to a minimum width specified in subsection 401-4.12. Place auger extensions within 20 inches of the screed extensions or per written manufacturer's recommendations.

401-4.6 ROLLERS. The number, type, and weight of rollers shall be sufficient to compact the asphalt to the required density while it is still in a workable condition without crushing of the aggregate, depressions or other damage to the pavement surface. Rollers shall be in good condition, clean, and capable of operating at slow speeds to avoid displacement of the asphalt. All rollers shall be specifically designed and

suitable for compacting asphalt concrete and shall be properly used. Rollers that impair the stability of any layer of a pavement structure or underlying soils shall not be used.

401-4.7 DENSITY DEVICE. The Contractor shall have on site a density gauge during all paving operations in order to assist in the determination of the optimum rolling pattern, type of roller and frequencies, as well as to monitor the effect of the rolling operations during production paving. The Contractor shall supply a qualified technician during all paving operations to calibrate the gauge and obtain accurate density readings for all new asphalt. These densities shall be supplied to the Engineer upon request at any time during construction. No separate payment will be made for supplying the density gauge and technician.

401-4.8 PREPARATION OF ASPHALT BINDER. The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the asphalt binder to the mixer at a uniform temperature. The temperature of unmodified asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325°F when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F when added to the aggregate.

401-4.9 PREPARATION OF MINERAL AGGREGATE. The aggregate for the HMA shall be heated and dried. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F when the asphalt binder is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

401-4.10 PREPARATION OF HMA. The aggregates and the asphalt binder shall be weighed or metered and mixed in the amount specified by the JMD.

The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants.

The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in AASHTO T 195, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles.

For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer.

The moisture content of all HMA upon discharge shall not exceed 0.5% of the total weight of mix, as determined by ATM 407.

401-4.11 APPLICATION OF PRIME AND TACK COAT. Immediately before placing the HMA, the underlying course shall be cleaned of all dust and debris.

If required, a prime coat in accordance with Item P-602 Emulsified Asphalt Prime Coat shall be applied to aggregate base prior to placing HMA.

A tack coat shall be applied in accordance with Item P-603 Emulsified Asphalt Tack Coat to all vertical and horizontal asphalt and concrete surfaces prior to placement of the first and each subsequent lift of HMA.

401-4.12 LAYDOWN PLAN, TRANSPORTING, PLACING, AND FINISHING. Prior to the placement of the HMA, the Contractor shall prepare a laydown plan with the sequence of paving lanes and width to minimize the number of cold joints; the location of any temporary ramps; laydown temperature; and estimated time of completion for each portion of the work (milling, paving, rolling, cooling, etc.). The laydown plan and any modifications shall be approved by the Engineer.

The Contractor shall use an MTV conforming to the requirements of subsection 401-4.4.1 to deliver mix to the paver.

Deliveries shall be scheduled so that placing and compacting of asphalt is uniform with minimum stopping and starting of the paver. Supply echelon paving operations with hot mix asphalt at a minimum rate of 400 tons per hour. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to approximately ambient temperature. The Contractor, at their expense, shall be responsible for repair of any damage to the pavement caused by hauling operations.

Contractor shall survey each lift of HMA surface course and certify to the Engineer that every lot of each lift meets the grade tolerances of subsection 401-6.2f before the next lift can be placed.

Edges of existing asphalt pavement abutting the new work shall be saw cut and the cut off material and laitance removed. Apply a tack coat in accordance with P-603 before new asphalt material is placed against it.

The speed of the paver shall be regulated to eliminate pulling and tearing of the asphalt mat. Placement of the HMA shall begin along the centerline of a crowned section or on the high side of areas with a one way slope unless shown otherwise on the laydown plan as accepted by the Engineer. The HMA shall be placed in consecutive adjacent lanes having a minimum width of 20 feet except where edge lanes require less width to complete the area. Additional screed sections attached to widen the paver to meet the minimum lane width requirements must include additional auger sections to move the HMA uniformly along the screed extension.

The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least one foot; however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the asphalt may be spread and luted by hand tools.

The Engineer may at any time, reject any batch of asphalt, on the truck or placed in the mat, which is rendered unfit for use due to contamination, segregation, incomplete coating of aggregate, or overheated HMA. Such rejection may be based on only visual inspection or temperature measurements. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the Engineer, and if it can be demonstrated in the Department's laboratory, in the presence of the Engineer, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

Areas of segregation in the surface course, as determined by the Engineer, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of the construction lift thickness for the approved mix design. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet long.

Echelon paving shall be used for the final lift of HMA pavement. Pave the final lift of HMA with two pavers operating in echelon in adjacent lanes with a breakdown roller behind each paver operating with intelligent compaction equipment. The pavers shall be spaced no more than 50 feet apart. The distance between the pavers shall be reduced as required to ensure the HMA placed by the lead paver is greater than 230°F when the second paver places material against it. Two paving crews are required.

401-4.13 COMPACTION OF HMA. After placing, the HMA shall be thoroughly and uniformly compacted by self-propelled rollers. The surface shall be compacted as soon as possible when the asphalt has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any surface defects and/or displacement occurring as a result of the roller, or from any other cause, shall be corrected at the Contractor's expense.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross-section, and the required field density is obtained. To prevent

adhesion of the asphalt to the roller, the wheels shall be equipped with a scraper and kept moistened with water as necessary.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with power tampers approved by the Engineer.

Any mixture that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding pavement. This work shall be done at the Contractor's expense. Skin patching shall not be allowed.

401-4.14 JOINTS. The formation of all joints shall be made to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

The roller shall not pass over the unprotected end of the freshly laid asphalt except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. Any longitudinal joint should also have the use of a bulkhead for any traffic that may also cause a rolled edge. In both methods, all contact surfaces shall have a tack coat or joint adhesive applied, dependent on top/bottom asphalt lift, before placing any fresh mix against the joint.

Longitudinal joints shall be formed in such a manner that the joint meets density requirements of subsection 401-6.2c. Longitudinal joints which have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F; or are irregular, damaged, uncompacted or otherwise defective shall be cut back with a cutting wheel or pavement saw a minimum of 3 inches and a maximum of 6 inches to expose a clean, sound, uniform vertical surface for the full depth of the course. All cutback material and any laitance produced from cutting joints shall be removed from the project. Asphalt tack coat in accordance with P-603 shall be applied to the clean, dry joint prior to placing any additional fresh asphalt against the joint. The cost of this work shall be considered incidental to the cost of the asphalt.

For all joints below the top lift, uniformly coat joint surfaces with tack coat material meeting P-603.

When joint adhesive is required, follow joint adhesive manufacturer's recommendations for temperatures and application method. Otherwise, use tack coat material meeting Item P-603. Remove joint adhesive applied to the top of pavement surface. When forming a longitudinal joint in the final lift, apply a 1/8 inch thick band joint adhesive to the full height of the joint surface prior to placing any fresh hot mix asphalt against the joint. Joint edge preparation, and joint adhesive application temperature, thickness, and method shall be per the manufacturer's recommendations. Joint adhesive is not required between mats placed while echelon paving.

Joint sealant shall be applied in a 12-inch wide strip centered over joints in the final lift layer of HMA while the asphalt is still clean, free of moisture, and before striping. Joint sealant shall be applied over joints in the final lift formed by two panels of HMA composed of different type or class of mix; or of new against existing HMA pavement. Joint surface preparation, and joint sealant application temperature, thickness, and method shall be per the manufacturer's recommendations.

Joints between existing and new HMA shall be saw cut. Cut a neat, straight line along the existing HMA to expose the full depth of the layer where new HMA is to be placed against existing asphalt. Use a power saw or other method approved by the Engineer.

Cut back of all cold joints is required as specified above.

The Contractor may provide additional joint density quality control by use of joint heaters at the Contractor's expense. The heaters shall be operated so they do not produce excessive heat when the units pass over new or previously paved material. When used, heaters will be required to be in operation at all times.

Electrically powered infrared heating equipment should consist of one or more low-level radiant energy heaters to uniformly heat and soften the pavement joints. The heaters should be configured to uniformly heat an area up to 18 inches in width and 3 inches in depth. Infrared equipment shall be thermostatically controlled to provide a uniform, consistent temperature increase throughout the layer being heated up to a maximum temperature range of 200°F to 300°F.

Propane powered infrared heating equipment shall be attached to the paving machine and the output of infrared energy shall be in the one to six-micron range. Converters shall be arranged end to end directly over the joint to be heated in sufficient numbers to continuously produce, when in operation, a minimum of 240,000 BTU per hour. The joint heater shall be positioned not more than one inch above the pavement to be heated and in front of the paver screed and shall be fully adjustable.

401-4.15 SAW-CUT GROOVING. If shown on the Plans, saw-cut grooves shall be provided as specified in Item P-621 Saw Cut Grooves. Do not perform saw-cut grooving until smoothness testing has been performed, as described in subsection 401-5.3.

401-4.16 DIAMOND GRINDING. Diamond grinding shall be completed prior to pavement grooving. Diamond grinding shall be accomplished by sawing with saw blades impregnated with industrial diamond abrasive.

Diamond grinding shall be performed with a machine designed specifically for diamond grinding capable of cutting a path at least 3 feet wide. The saw blades shall be 1/8-inch wide with a sufficient number of blades to create grooves between 0.090 and 0.130 inches wide; and peaks and ridges approximately 1/32-inch higher than the bottom of the grinding cut. The actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate.

Equipment or grinding procedures that cause ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted. The Contractor shall demonstrate to the Engineer that the grinding equipment will produce satisfactory results prior to making corrections to surfaces. Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. The Contractor shall apply a surface treatment per Item P-608 Emulsified Asphalt Seal Coat to all areas that have been subject to grinding.

401-4.17 NIGHTTIME PAVING REQUIREMENTS. Paving during nighttime construction shall require the following:

- a. All paving machines, rollers, distribution trucks and other vehicles required by the Contractor for his operations shall be equipped with artificial illumination sufficient to safely complete the work.
- b. Minimum illumination level shall be twenty horizontal foot-candles and maintained in the following areas:
 - (1) An area of 30 feet wide by 30 feet long immediately behind the paving machines during the operations of the machines.
 - (2) An area 15 feet wide by 30 feet long immediately in front and back of all rolling equipment, during operation of the equipment.
 - (3) An area 15 feet wide by 15 feet long at any point where an area is being tack coated prior to the placement of pavement.
- c. As partial fulfillment of the above requirements, the Contractor shall furnish and use, complete artificial lighting units with a minimum capacity of 3,000 watt electric beam lights, affixed to all equipment in such a way to direct illumination on the area under construction.
- d. A lighting plan must be submitted by the Contractor and approved by the Engineer prior to the start of any nighttime work.

Lighting for nighttime construction is required for work occurring between end civil twilight and begin civil twilight as posted the United States Naval Observatory on all days except the “No Lighting Required” period shown in Table 401-10.

TABLE 401-10. NIGHTTIME ILLUMINATION EXCLUSIONS

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

CONTRACTOR QUALITY CONTROL (CQC)

401-5.1 GENERAL. The Contractor shall develop a CQC Program (CQCP) according to the GCP Section 100. No partial payment will be made for materials that are subject to specific QC requirements without an approved CQCP.

401-5.2 CONTRACTOR QUALITY CONTROL (QC) FACILITIES. The Contractor shall provide or contract for testing facilities in accordance with GCP Section 100. The Engineer shall be permitted unrestricted access to inspect the Contractor’s QC facilities and witness QC activities. The Engineer will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

401-5.3 QUALITY CONTROL (QC) TESTING. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to these Specifications, and as set forth in the approved CQCP. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness. A QC Testing Plan shall be developed as part of the CQCP.

- a. **Asphalt Content.** A minimum of two tests shall be performed per day in accordance with ATM 405 or ATM 406, by total weight of mix for determination of asphalt content. When using ATM 406, the correction factor shall be determined as part of the first test performed at the beginning of plant production; and as part of every tenth test performed thereafter. The asphalt content for the day will be determined by averaging the test results.
- b. **Gradation.** Aggregate gradations shall be determined a minimum of twice per lot from mechanical analysis of extracted aggregate in accordance with ATM 304 and ATM 408.

- c. **Moisture Content of Aggregate.** The moisture content of aggregate used for production shall be determined a minimum of once per day in accordance with ATM 202.
- d. **Moisture Content of Asphalt.** The moisture content shall be determined once per day in accordance with ATM 407.
- e. **Temperatures.** Temperatures shall be checked, at least four times per day, at necessary locations to determine the temperatures of the dryer, the asphalt binder in the storage tank, the asphalt at the plant, and the asphalt at the job site.
- f. **In-place Density Monitoring.** The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ATM 411.
- g. **Smoothness for Contractor Quality Control.** The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than 1/4-inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues.

The Contractor may use a 12-foot straightedge, a rolling inclinometer meeting the requirements of ASTM E2133, or rolling external reference device that can simulate a 12-foot straightedge approved by the Engineer. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement.

Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using the FAA profile program, ProFAA, or FHWA ProVal, using the 12-foot straightedge simulation function.

Smoothness readings shall not be made across grade changes or cross slope transitions. The transition between new and existing pavement shall be evaluated separately for conformance with the Plans.

- (1) **Transverse Measurements.** Transverse measurements shall be taken for each day's production placed. Transverse measurements shall be taken perpendicular to the pavement centerline each 50 feet or more often as determined by the Engineer. The joint between lanes shall be tested separately to facilitate smoothness between lanes.
- (2) **Longitudinal Measurements.** Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet; and at the third points of paving lanes when widths of paving lanes are 20 feet or greater. When placement abuts previously placed material the first measurement shall start with one half the length of the straight edge on the previously placed material.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4-inch shall be corrected with diamond grinding per subsection 401-4.16 or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding.

All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in subsection 401-6.2d. Areas that have been ground shall be

sealed with a surface treatment in accordance with Item P-608. To avoid the surface treatment creating any conflict with runway or taxiway markings, it may be necessary to seal a larger area.

Control charts shall be kept to show area of each day's placement and the percentage of corrective grinding required. Corrections to production and placement shall be initiated when corrective grinding is required. If the Contractor's machines and/or methods produce significant areas that need corrective actions in excess of 10 percent of a day's production, production shall be stopped until corrective measures are implemented by the Contractor.

- h. Grade.** Grade shall be evaluated daily to allow adjustments to paving operations when grade measurements do not meet Specifications. As a minimum, grade shall be evaluated prior to and after the placement of the first lift and after placement of the surface lift.

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and Plans. The final surface of the pavement will not vary from the grade line elevations and cross-sections shown on the Plans by more than 1/2-inch vertically and 0.1 feet laterally. The documentation will be provided by the Contractor to the Engineer within 24 hours.

Areas with humps or depressions that exceed grade or smoothness criteria and that retain water on the surface must be ground off provided the course thickness after grinding is not more than 1/2-inch less than the thickness specified on the Plans. Grinding shall be in accordance with subsection 401-4.16.

The Contractor shall repair low areas or areas that cannot be corrected by grinding by removal of deficient areas to the depth of the final course plus 1/2-inch and replacing with new material. Skin patching is not allowed.

401-5.4 SAMPLING. When directed by the Engineer, the Contractor shall sample and test any material that appears inconsistent with similar material being sampled, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

401-5.5 CONTROL CHARTS. The Contractor shall maintain linear control charts for both individual measurements and range (i.e. difference between highest and lowest measurements) for aggregate gradation, asphalt binder content, and density.

Control charts shall be posted in a location satisfactory to the Engineer and kept current. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a problem and the Contractor is not taking satisfactory corrective action, the Engineer may suspend production or acceptance of the material.

- a. Individual Measurements.** Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation, asphalt binder content, and density. The control charts shall use the JMD target values as indicators of central tendency for the test parameters with associated Action and Suspension Limits in Table 401-11.

Table 401-11. CONTROL CHART LIMITS FOR INDIVIDUAL MEASUREMENTS

Sieve	Action Limit	Suspension Limit
3/4-inch	±6%	±9%
1/2-inch	±6%	±9%

3/8-inch	±6%	±9%
No. 4	±6%	±9%
No. 16	±5%	±7.5%
No. 50	±3%	±4.5%
No. 200	±2%	±3%
Asphalt Binder Content	±0.45%	±0.70%
Minimum VMA	-0.5%	-1.0%

- b. **Range.** Control charts for range shall be established to control process variability for the test parameters and Suspension Limits listed in Table 401-12. The range shall be computed for each lot as the difference between the two test results for each control parameter. The Suspension Limits specified below are based on a sample size of $n = 2$. Should the Contractor elect to perform more than two tests per lot, the Suspension Limits shall be adjusted by multiplying the Suspension Limit by 1.18 for $n = 3$ and by 1.27 for $n = 4$.

Table 401-12. CONTROL CHART LIMITS BASED ON RANGE (n = 2)

Sieve	Suspension Limit
1/2-inch	11%
3/8-inch	11%
No. 4	11%
No. 16	9%
No. 50	6%
No. 200	3.5%
Asphalt Content	0.8%

- c. **Corrective Action.** The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of tolerance. The Plan shall contain rules to gauge when a process is out of control and detail what action will be taken to bring the process into control. As a minimum, a process shall be deemed out of control and production stopped and corrective action taken, if:

- (1) One point falls outside the Suspension Limit line for individual measurements or range; or
- (2) Two points in a row fall outside the Action Limit line for individual measurements.

401-5.6 QUALITY CONTROL (QC) REPORTS. The Contractor shall maintain records and shall submit reports of QC activities daily, in accordance with the CQCP described in GCP Section 100.

MATERIAL ACCEPTANCE

401-6.1 ACCEPTANCE SAMPLING AND TESTING. All acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the Engineer at no cost to the Contractor except that coring as required in this section shall be completed and paid for by the Contractor. Selection of sampling and testing methods used for Acceptance are at the discretion of the Engineer.

- a. Lot size.

- (1) **Hot Mix Asphalt Lots.** The bid quantity of each type of HMA produced and placed will be divided into lots and the lots evaluated individually for acceptance. The Department has the exclusive right and responsibility for determining the acceptability of all materials incorporated

into the project. The results of the acceptance testing performed by the Engineer will be made available to the Contractor.

Where more than one plant is simultaneously producing asphalt for the job, the lot sizes will apply separately for each plant

- (2) **5,000 Ton Lot Size.** A lot will normally be 5,000 tons. The lot will be divided into sub-lots of 500 tons, each randomly sampled and tested for asphalt binder content, density and gradation according to this subsection. The lot is evaluated for price adjustment according to subsection 401-6.2. Seasonal startup or a new JMD requires starting a new lot.

If the project has more than one lot and if less than eight sub-lots have been sampled at the time a lot is terminated, the material in the shortened lot will be included as part of the prior lot and the price adjustment computed for the prior lot will include the samples from the shortened lot. Density test results from material in the shortened lot will be based on the MSG of the shortened lot. If there is no prior lot, and there are at least three sub-lots, the material in the shortened lot will be considered as a lot and the price adjustment will be based on the actual number of test results in the shortened lot. If there are less than three sub-lots, the HMA will be accepted for payment based on the Engineer's approval of the JMD, and placement and compaction of the HMA to the specified depth, finished surface requirements and tolerances. The Engineer reserves the right to perform any testing required in order to determine acceptance.

If eight or nine sub-lots have been placed at the time a lot is terminated, they will be considered as a lot and the price adjustment will be based on the actual number of test results in the shortened lot.

- (3) **1,500 to 4,999 Ton Lot Size.** If the total contract bid quantity is between 1,500 tons and 4,999 tons, the total project quantity will be considered one lot. The lot will be divided into sub-lots of 500 tons and randomly sampled for asphalt binder content, density and gradation according to this subsection. The lot will be evaluated for price adjustment according to subsection 401-6.2 except as noted.
- (4) **Under 1,500 Ton Lot Size.** If the total contract bid quantity is less than 1,500 tons, asphalt concrete pavement will be accepted for payment based on the Engineer's approval of a Job Mix design and the placement and compaction of the HMA to the specified depth and finished surface requirements and tolerances, and material testing. The Engineer reserves the right to perform any testing required in order to determine acceptance.

Any area of finished surfacing that is segregated, fails to meet surface tolerance requirements, cools to below 175°F prior to completing compaction, or is any other way defective shall be removed and replaced with new asphalt concrete pavement. Removal and replacement of defective pavement shall be at no additional cost to the Department.

- (5) **Joint Density Lot Size.** Longitudinal joints include joints internal to a lot and joints created when paving adjacent to previously placed lots. Joints constructed by echelon paving will not be evaluated for density, unless required by the Engineer.
- (6) **Asphalt Binder Grade Lot Size.** The lot size for asphalt binder is 200 tons of the same grade asphalt binder. If a project has more than one lot and the remaining asphalt binder quantity of the same grade is less than 150 tons, it is added to the previous lot and that total quantity will be evaluated as one lot. If the remaining asphalt binder quantity is 150 tons or greater, it is sampled, tested and evaluated as a separate lot.

If the bid quantity of asphalt binder is between 85 and 200 tons, the contract quantity is considered as one lot and sampled, tested, and evaluated according to this subsection.

Quantities of asphalt binder less than 85 tons will be accepted based on manufacturer's certified test reports and certification of compliance.

b. Sampling.

- (1) **Asphalt Binder Content.** Samples taken for the determination of asphalt binder content will be taken from behind the screed prior to initial compaction, or from the windrow, according to ATM 402 and ATM 403.

If sampling is from behind the screed prior to initial compaction, then provide a WAQTC certified technician and equipment to take plate samples. Sample in locations determined by the Engineer. Sample in the presence of the Engineer and immediately transfer possession of the sample to the Engineer.

Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if applicable.

- (2) **Gradation.** Samples taken for the determination of aggregate gradation will be from the same location as specified for the determination of asphalt binder content. Two separate samples will be taken, one for acceptance testing and one held in reserve for retesting if applicable.

- (3) **Mat Density.** The location(s) for taking core samples is determined using a set of random numbers (independent of asphalt binder and aggregate sampling set of random numbers) and the Engineer's judgment. The Contractor shall cut full depth core samples with a diameter of 6 inches from each sub-lot, within 24 hours of final rolling for density acceptance testing. The samples shall be neatly cut by a core drill at the randomly selected location designated by the Engineer according to the procedures contained in ATM 413.

All voids left by sampling shall be backfilled with new asphalt concrete material and compacted within 24 hours of sampling. All core holes on final lift will be sealed with GSB-88, after being backfilled and compacted, or have Craftco Joint adhesive applied prior to backfill and compaction.

Cores for mat density shall not be taken closer than one foot from a transverse or longitudinal joint.

- (4) **Joint Density.** Longitudinal joint density cores shall be taken directly on the joint, at locations adjacent to cores taken from the mat completing the joint. Cores shall be taken by the Contractor in the presence of the Engineer. The Engineer will take immediate possession of the samples.

- (5) **Asphalt Binder Grade.** Sample asphalt binder at the plant from the supply line in the presence of the Engineer according to ATM 401. The Engineer will take immediate possession of the samples. Take three samples from each lot, one for acceptance testing, one for Contractor requested retesting, and one held in reserve for referee testing if requested.

c. Testing.

- (1) **Asphalt Binder Content.** Asphalt binder content will be determined by ATM 405 or ATM 406, by total weight of mix.

- (2) **Gradation.** Cold feed or dry batched aggregate gradations will be tested according to ATM 304 and evaluated for acceptance according to subsection 401-6.2. Asphalt concrete mix and core sample gradations will be determined according to ATM 408 from extracted aggregate, or aggregate remaining after the ignition oven ATM 406 has burned off the asphalt binder.

- (3) **Density.** Mat density will be based on theoretical maximum specific gravity (MSG) as determined by ATM 409. For the first lot of HMA, the MSG will be determined by the JMD. For

additional lots, the MSG will be determined from the randomly selected sample from the first sub-lot.

For the top lift longitudinal joint density, use the MSG of the panel completing the joint. No adjustment will be made to the MSG or any other material property, due to application of joint adhesive, in evaluating joint density.

Core samples will be tested according to ATM 410, and evaluated for acceptance according to subsection 401-6.2.

- (4) Asphalt Binder Grade.** Asphalt binder will be tested for conformance to the requirements specified in subsection 401-2.3 and evaluated for acceptance according to subsection 401-6.2.

401-6.2 ACCEPTANCE CRITERIA.

- a. General.** Acceptance will be based on the following characteristics of the HMA and completed pavement as well as the implementation of the Contractor's Quality Control Plan (CQCP) and test results:

- (1)** Aggregate Gradation
- (2)** Asphalt Binder Content
- (3)** Mat Density
- (4)** Joint Density
- (5)** Thickness
- (6)** Smoothness
- (7)** Grade
- (8)** Asphalt Binder Quality

The Engineer may at any time reject and require the Contractor to dispose of any batch of HMA which is rendered unfit for use due to contamination, segregation, incomplete coating of aggregate, or improper mix temperature. Such rejection may be based on only visual inspection or temperature measurements. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the Engineer, and, if it can be demonstrated in a certified laboratory, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

- b. Mat Density, Aggregate Gradation, and Asphalt Binder Content.** Evaluation for acceptance of each lot of plant-produced material for mat density, aggregate gradation, and asphalt binder content will be based on percentage of material within specification limits (PWL). Acceptance and payment for the lot will be according to subsection 401-8.1.

- (1) Percentage of Material within Specification Limits (PWL).** Acceptance of test results for HMA asphalt binder content, gradation and mat density are used in HMA price adjustment. These test results for a lot are analyzed collectively and statistically by the Quality Level Analysis (QLA) method as specified in GCP Section 110 to determine the total estimated percentage of the lot that is within specification limits.

HMA pay factors are computed as follows:

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

- (b) The USL and LSL are equal to the Target Value (TV) plus and minus the allowable tolerances. The specification tolerance limits (L) and (U) are contained in Table 401-13. The values for percent passing the No. 200 sieve, asphalt binder content and density test results are reported to the nearest 0.1%. All other sieves used in QLA are reported to the nearest whole number. The TV is the specification value shown on the approved JMD.

**TABLE 401-13. LOWER SPECIFICATION TOLERANCE LIMIT (L)
AND UPPER SPECIFICATION TOLERANCE LIMIT (U)**

Measured Characteristics	L	U
3/4 in.	99	100
1/2 in.	TV -6	TV +6
3/8 in.	TV -6	TV +6
No. 4	TV -6	TV +6
No. 8	TV -6	TV +6
No. 16	TV -5	TV +5
No. 30	TV -4	TV +4
No. 50	TV -4	TV +4
No. 100	TV -3	TV +3
No. 200 *	TV -2.0 *	TV +2.0
Asphalt %	TV -0.4	TV +0.4
Mat Density	93.0%	100.0%

TV (Target Value) = Job Mix Design value for gradation and asphalt binder content

* L for the No. 200 sieve is restricted by the broadband limits Table 401-8.

- c. **Longitudinal Joint Density.** The minimum density for top lift longitudinal joint density is 92.0% of the MSG of the panel completing the joint. MSG will be determined according to ATM 409. Top lift longitudinal joints will be evaluated for acceptance according to 401-8.1b.

For a joint core that is less than 92.0% of the MSG perform corrective action on the subplot containing the joint core. Perform Corrective Action by heating the longitudinal joint to compaction temperatures with an infrared heater and compact to at least 92.0% of the MSG. Do not exceed mixing temperatures as indicated on the mix design. Material may be added to the joint to meet surface tolerances, but do not skin patch. Perform corrective action prior to grooving or striping. After corrective action is performed and joint is acceptable, seal the joints in the sub-lot per 401-4.14.

- d. **Thickness.** Thickness of each lift will be evaluated by the Engineer to the requirements shown on the Plans. Measurements of thickness will be made by the Engineer using the cores extracted from the mat for each sub-lot for density measurement. The maximum allowable deficiency at any point will not be more than 1/4-inch less than the thickness indicated for the lift. Average thickness of lift, or combined lifts, will not be less than the indicated thickness. Where the thickness tolerances are not met, the lot or sub-lot shall be corrected by the Contractor at his expense by removing the deficient area and replacing with new pavement. The Contractor, at his expense, may take additional cores as approved by the Engineer to circumscribe the deficient area.

- e. **Smoothness.**

- (1) **Non-runway HMA.** The finished surfaces of the HMA shall not vary more than 1/4 inch for the surface layer when tested with a 12-foot straightedge. Straightedge testing will be performed in accordance with subsection 401-6.2e(2)(a).

(2) **Runway HMA.** The final surface shall be free from roller marks and will be subject to the following smoothness testing.

(a) **Straight Edge Testing.** After the final rolling, the surface of each lot shall be tested in both transverse and longitudinal directions for smoothness. The finished surface course of the pavement shall not vary more than 1/4-inch when evaluated with a 12-foot straightedge. Measurements will include joints.

1. **Transverse Measurements.** Transverse measurements will be taken for each lot placed. Transverse measurements will be taken perpendicular to the pavement centerline every 50 feet or more often as determined by the Engineer.

2. **Longitudinal Measurements.** Longitudinal measurements will be taken for each lot placed. Longitudinal tests will be parallel to the centerline of paving; at the center.

(b) **Profilograph Smoothness for QA Acceptance.** The final profilograph shall be the full length of the project to facilitate testing of roughness between lots. The Engineer will perform a profilograph roughness test on the completed project with a profilograph meeting the requirements of ASTM E1274 or a Class I inertial profiler meeting ASTM E950. Data and results shall be provided within 48 hours of profilograph roughness tests.

The pavement shall have an average profile index less than 15 inches per mile per 1/10-mile. The equipment shall utilize electronic recording and automatic computerized reduction of data to indicate "must grind" bumps and the Profile Index for the pavement using a 0.2-inch blanking band. The bump template must span one inch with an offset of 0.4 inches. The profilograph must be calibrated prior to use and operated by a factory or Department approved, trained operator.

Profilograms shall be recorded on a longitudinal scale of one inch equals 25 feet and a vertical scale of one inch equals one inch. Profilograph shall be performed one foot right and left of project centerline and 15 feet right and left of project centerline.

(c) **Corrective Action.** Areas of unacceptable smoothness on final surface course shall be corrected with diamond grinding per subsection 401-4.16 or by removing and replacing full depth of surface course.

Where corrections are necessary, a second profilograph run shall be performed to verify that the corrections produced an average profile index of 15 inches per mile per 1/10-mile or less.

f. **Grade.** Grade shall be evaluated after the first day of placement and then as a minimum, prior to the placement of the surface lift and after the placement of the surface lift to allow adjustments to paving operations if measurements do not meet specification requirements. The Contractor shall provide the survey data/results to the Engineer by the following day after the measurements have been taken. Measurements shall be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and 50-foot longitudinal spacing on cross sections verifying that the surface is in conformance with project Plans and cross sections. Data shall include the difference between the measured surface and plan grades.

The finished surface of the pavement shall not vary from the gradeline elevations and cross sections shown on the Plans by more than 0.05-foot. The finished grade of each lot will be determined by running levels at intervals of 50 feet or less longitudinally and transversely to determine the elevation of the completed pavement. The lot size will be 2,000 square yards. When more than 15% of all the measurements within a lot are outside the specified tolerance, the Contractor shall remove the deficient area and replace with new material. Removal depth shall be a minimum of 2 inches. Skin patching for correcting low areas will not be permitted. High points may be ground off.

- g. Asphalt Binder Quality.** Acceptance and payment for the lot shall be determined according to subsection 401-8.1c. If three consecutive samples are out of specification, stop HMA production immediately and submit a corrective action plan to the Engineer for approval.

401-6.3 RETESTS.

- a. General.** When test results have failed to meet specification tolerance limits, retest of acceptance test results for asphalt binder content, gradation, and density may be requested provided the quality control requirements of subsection 401-6.3 are met. Deliver this request in writing to the Engineer within seven days of receipt of the final test of the lot.

The Engineer will mark the sample location for the density retest within a 2-foot radius of the original core. The original test results are discarded and the retest result is used in the price adjustment calculation regardless of whether the retest result gives a higher or lower pay factor.

Only one retest per sample is allowed. Except for the first lot, when gradation and asphalt binder content are determined from the same sample, retesting for gradation or asphalt binder from the first sub-lot of a lot will include retesting for the MSG; when separate samples are used, retesting for asphalt binder content will include retesting for MSG.

When gradation and asphalt binder content are determined from the same sample, a request for a retest of either gradation or asphalt binder content results in a retest of both. Both gradation and asphalt binder content retest results are used in the price adjustment calculation. Retesting will be performed by a department laboratory.

- (1) A redefined PWL will be calculated for the lot.
- (2) The cost for resampling shall be borne by the Contractor.
- (3) Asphalt Binder Grade Retest. Retest of acceptance test results may be requested provided the quality control requirements of subsection 401-6.3 are met.

The assigned test value (ATV) will be determined using ASTM D3244. Testing will be by AASHTO accredited independent laboratories. Each test will be completed by a different laboratory.

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

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

The Engineer will send the third sample (referee sample) to an agreed upon laboratory. The average of the combined test results ($[\text{acceptance} + \text{retest} + \text{referee}]/3$) equals the ATV. If the ATV fails to meet Specifications, the Contractor pays for the referee test.

- b. Payment for Resampled Lots.** The redefined PWL for a resampled lot will be used to calculate the payment for that lot according to GCP Section 110.

401-6.4 RESAMPLING PAVEMENT FOR MAT DENSITY. (Subsection Not Used)

401-6.5 LEVELING COURSE. The leveling course is the first variable thickness lift placed to correct surface irregularities prior to placement of subsequent courses. The leveling course shall meet the aggregate gradation in Table 401-8, subsection 401-3.3. The leveling course shall meet the requirements

of subsection 401-3.3 and 401-6.2, but shall not be subject to the mat density or joint density requirements. The leveling course shall be compacted with the same effort used to achieve density of the control strip. The leveling course shall not exceed the lift thickness associated with each gradation in Table 401-8, subsection 401-3.3.

METHOD OF MEASUREMENT

401-7.1 MEASUREMENT. HMA will be measured by the number of tons used in the accepted work, based on recorded truck scale weights. No deduction will be made for the weight of asphalt binder in the mixture.

Asphalt binder will be measured by the number of tons of asphalt binder used in the accepted pavement determined as follows:

The method of measurement to be used will be based on one of the following procedures listed in subsections a, b, and c.

- a. Supplier's invoices minus waste, diversion and excess left over. This method may be used on projects where deliveries are made in sealed tankers and the plant is producing material for one project only. Method b. will be used to compute left over. Waste and diversion will be computed in a manner to be determined by the Engineer.
- b. Volume measure (tank stickings) of actual daily uses. It is the Contractor's responsibility to notify the Engineer whenever material is to be added to the calibrated volume measure or whenever material from the volume measure is to be used for work other than that specified in this contract.
- c. Percent of asphalt binder content for each sub-lot as determined by ATM 405 or ATM 406 multiplied by the weight represented by that sub-lot.

Method c. will be used for determining asphalt binder quantity unless otherwise directed in writing by the Engineer. Whichever method is used must be used for the duration of the project. Another method may be used and computed as a check, but only one method will be used for payment computation.

Longitudinal Joint Density Price Adjustment will be measured by the linear foot of top lift longitudinal joint under subsection 401-8.1(b).

Joint Adhesive will be measured by the linear foot of longitudinal and transverse joint.

401-7.2 ASPHALT MATERIAL PRICE ADJUSTMENT. Asphalt Material Price Adjustment. This subsection provides a price adjustment for asphalt material by: (1) additional compensation to the Contractor or (2) a deduction from the contract amount.

- a. This provision shall apply:
 - (1) To asphalt binder material meeting the criteria of section P-401-2.3, and is included in items listed in the bid schedule of section P-602, P-603, P-609, and P-626.
 - (2) When there is more than 500 tons of asphalt material in the bid schedule of section described in 401-7.2.a(1).
 - (3) To cost changes in asphalt material that occur between the date of bid and the date on the certified bill of lading from the asphalt material refiner/producer.
 - (4) When there is more than a seven and one half percent (7.5%) increase or decrease in the Alaska Asphalt Material Price Index (AAMPI) from the date of bid opening to the date on the certified bill of lading from the asphalt refiner/producer.
- b. Provide the certified bill of lading from the asphalt material refiner/producer.

- c. The AAMPI is calculated bimonthly on the first and third Friday of each month, and will remain in effect from the day of calculation until the next bimonthly calculation. The AAMPI is posted on the Department's Statewide Materials website at and calculated according to the formula posted there. http://www.dot.state.ak.us/stwddes/desmaterials/aprice_index.shtml
- d. Price adjustment will be cumulative and calculated with each progress payment. Use the AAMPI in effect in the date of the certified bill of lading from the asphalt material refiner/producer, to calculate the price adjustment for asphalt material. The Department will increase or decrease payment under this contract by the amount determined with the following asphalt material price adjustment formula:
- (1) For an increase exceeding 7.5 percent, additional compensation = $[(IPP - IB) - (0.075 \times IB)] \times Q$
- (2) For a decrease exceeding 7.5 percent, deduction from contract = $[(IB - IPP) - (0.075 \times IB)] \times Q$
- Where:
- Q = Quantity of asphalt material incorporated into the project during the pay period, in tons as measured by the Engineer
- IB = Index at Bid: The bimonthly AAMPI in effect on the date of bid, in dollars per ton
- IPP = Index at Pay Period: the bimonthly AAMPI in effect on the date shown on the certified bill of lading from the asphalt refiner/producer, in dollars per ton
- e. Method of measurement for determining Q (quantity) is the weight of asphalt material that meets criteria of this subsection and is incorporated into the project. The quantity does not include aggregate, mineral filler, blotter material, thinning agents added after material qualification, or water for emulsified asphalt. The quantity for emulsified asphalts will be based on the asphalt residue material only and will be calculated using the percent residue from testing, or if not tested, from the manufacturers certificate of compliance.

BASIS OF PAYMENT

401-8.1 PAYMENT. Payment for an accepted lot of HMA will be made at the contract unit price per ton for HMA and asphalt binder adjusted according to subsection 401-8.1a. The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

- a. HMA Price Adjustment.** The HMA price adjustment will be the sum of the HMA price adjustments for each lot. Acceptance test results for HMA asphalt binder content, gradation, and mat density are used in the HMA price adjustment. These tests results for a lot are analyzed collectively and statistically by the Quality Level Analysis (QLA) method as specified in GCP subsection 110-01 to determine the total estimated percentage of the lot that is within specification limits.

The price adjustment will be based on the Composite Pay Factor (CPF) for asphalt binder content and aggregate gradation or the Density Pay Factor (DPF) whichever is the lowest value. Table 401-14 is used to determine the weight factor (f) for each sieve size and asphalt binder content. The HMA Composite Pay Factor (CPF) is computed for asphalt binder content and all sieves using the following formula:

$$CPF = \frac{[f_{3/4in} (PF_{3/4in}) + f_{1/2in} (PF_{1/2in}) + \dots + f_{ac} (PF_{ac})]}{\sum f}$$

TABLE 401-14. WEIGHT FACTORS

	Type I Factor "f"	Type II and V Factor "f"	Type III Factor "f"
1 in	4	-	-
3/4 in.	4	4	-
1/2 in.	4	5	4
3/8 in.	4	5	5
No. 4	4	4	5
No. 8	4	4	5
No. 16	4	4	5
No. 30	4	5	6
No. 50	4	5	6
No. 100	4	4	4
No. 200	20	20	20
Asphalt %	40	40	40

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

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

$$\text{HMA Price Adjustment} = [(CPF \text{ or } DPF)^* - 1] \times (\text{tons in lot}) \times (\text{PAB})$$

PAB = Price Adjustment Base per ton (for mix including asphalt binder)

*Composite Pay Factor (CPF) or Density Pay Factor (DPF) whichever is lower value.

Price Adjustment Base shall be the lessor of:

- (1) Dollars per ton as follows:

$$PAB = [\text{\$ } \quad] \text{ per ton Hot Mix Asphalt [Type } \quad], [\text{Class } \quad];$$

or,

(2) The value in dollars per ton calculated as follows: [Contractor's Bid/ton for Hot Mix Asphalt [Type], [Class]] +

$$[\text{Contractor's Bid/ton for Asphalt Binder, PG []}] \times (\% \text{ JMD Optimum Oil Content} / 100)$$

A lot containing material with less than a 1.000 pay factor is accepted at an adjusted price, provided that pay factor is at least 0.800 and there are no isolated defects identified by the Engineer. A lot containing material that fails to obtain the minimum pay factor is considered unacceptable and rejected under GCP Section 110.

Hot Mix Asphalt Price Adjustment also includes fees assessed for additional JMDs as identified in 401-3.2.

- b. **Longitudinal Joint Density Price Adjustment.** The longitudinal joint density price adjustment will be based on top lift cold joint densities greater than 93.0%. Add \$1.50 per lineal foot for one-half the distance to each prior and subsequent passing joint density greater than 93.0%.
- c. **Asphalt Binder Price Adjustment.** A lot quantity of asphalt binder, with a quality pay factor less than 1.000 is accepted or rejected according to Table 401-15, Asphalt Binder Quality Pay Factors.

Table 401-15. ASPHALT BINDER QUALITY PAY FACTORS

Pay Factor			1.01	1.00	0.95	0.90	0.75	Reject
RTFO (Rolling Thin Film Oven)								
DSR⁽¹⁾	All Grades	G*/Sinδ, kPa ⁻¹	≥2.69	2.68-2.20	2.19-1.96	1.95-1.43	1.42-1.10	< 1.10
	PG 52-40V	JNR 3.2	≤ 0.39	0.40-0.50	0.51-0.59	0.60-0.69	0.70-1.00	> 1.00
% Rec _{3.2}		≥ 86	85-75	74-68	67-60	59-55	< 55	
MSCR⁽²⁾	PG 58-34E	JNR 3.2	≤0.19	0.20-0.25	0.26-0.29	0.30-0.39	0.40-0.50	> 0.50
		% Rec _{3.2}	≥90	89-85	84-80	79-75	74-70	< 70
	PG 64-40E	JNR 3.2	≤ 0.05	0.05-0.10	0.11-0.15	0.16-0.20	0.21-0.25	> 0.25
		% Rec _{3.2}	≥97	96-95	94-91	90-85	84-80	< 80
PAV (Pressure Aging Vessel)								
DSR⁽³⁾	PG 64-40E And all other Grades	G*Sinδ, kPa	≤4711	4712 - 5000	5001-5289	5290-5578	5579-5867	> 5867
	PG 52-40V, PG 58-34E	G*Sinδ, kPa	≤5700	5701-6000	6001-6300	6301-6600	6601-7000	> 7000
CS^(4,5)	All Grades ⁽⁴⁾	BBR, "S" MPa	≤247	248-300	301-338	339-388	389-449	≥ 450
	All Grades ⁽⁵⁾	BBR, "M"	≥0.320	0.319-0.300	0.299-0.294	0.293-0.278	0.277-0.261	<0.261

Creep Stiffness (CS) Dynamic Shear Rheometer (DSR) Multiple Stress Creep Recovery (MSCR)
 Asphalt Binder Price Adjustment = (Lowest Pay Factor – 1.00) x (Binder Quantity) x PAB x 5

Select the lowest pay factor from:

RTFO (test at Performance Grade Temperature)

(1) DSR, All Grades, G*/Sinδ, kPa-1

(2) MSCR: PG, Select the highest pay factor, either JNR 3.2 or % Rec3.2

PAV

(3) Intermediate DSR, PG, $G^* \sin \delta$, kPa

(4) CS, All Grades, BBR, S MPa

(5) CS, All Grades, BBR, M

If Pay Item P401.130.0000 HMA Combined Price Adjustment is in the Bid Schedule, the Price Adjustment Pay Items (P401.080.0000 Hot Mix Asphalt Price Adjustment, Method 1, P401.110.0000 Longitudinal Joint Density Price Adjustment, and P401.120.0000 Asphalt Binder Quality Price Adjustment) will be paid under P401.130.0000 HMA Combined Price Adjustment.

Payment will be made under:

Item P401.010.____	Hot Mix Asphalt Type __, Class __ - per ton
Item P401.020.____	Asphalt Binder, PG __-per ton
Item P401.070.0000	Joint Adhesive -per linear foot
Item P401.080.0000	Hot Mix Asphalt Price Adjustment -per contingent sum
Item P401.090.0000	Asphalt Material Price Adjustment -per contingent sum

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Alaska Test Methods (ATM) Manual

ATM 202	Moisture Content of Aggregate and Soils
ATM 204	Liquid Limit of Soils
ATM 205	Plastic Limit and Plasticity Index of Soils
ATM 301	Sampling Aggregates
ATM 304	Sieve Analysis of Aggregate and Soils
ATM 305	Determining the Percentage of Fracture in Coarse Aggregate.
ATM 306	Flat and Elongated
ATM 307	Sand Equivalent
ATM 401	Sampling Bituminous Materials
ATM 402	Sampling Bituminous Mixes
ATM 403	Sampling Hot Mix Asphalt
ATM 405	Asphalt Binder Content of Asphalt Concrete Mixtures by the Nuclear Method
ATM 406	Asphalt Binder Content of Bituminous Mixes by Ignition Method
ATM 407	Moisture Content of Hot-Mix Asphalt (HMA) by Oven Method
ATM 408	Mechanical Analysis of Extracted Aggregate
ATM 409	Maximum Specific Gravity of Bituminous Mixes

ATM 410	Bulk Specific Gravity and Percent Compaction of Bituminous Mixes
ATM 411	In-Place Density of Asphalt Mixtures by Nuclear Method
ATM 413	Sampling Hot Mix Asphalt (HMA) after Compaction (Obtaining Cores)
ATM 414	Anti-Strip Requirements of Hot Mix Asphalt
ATM 417	Hot Mix Asphalt Design by the Marshall Method
ATM 419	Rutting Susceptibility using an Asphalt Pavement Analyzer

ASTM International (ASTM)

ASTM D5	Penetration of Bituminous Materials
ASTM D113	Ductility of Asphalt Materials
ASTM D242	Mineral Filler for Bituminous Paving Mixtures
ASTM D244	Practices for Emulsified Asphalts
ASTM D1073	Fine Aggregate for Asphalt Paving Mixtures
ASTM D2007	Characteristic Groups in Rubber Extender and Processing Oils and Other Petroleum-Derived Oils by the Clay-Gel Absorption Chromatographic Method
ASTM D2042	Solubility of Asphalt Materials in Trichloroethylene
ASTM D2172	Quantitative Extraction of Bitumen from Asphalt Paving Mixtures
ASTM D2669	Apparent Viscosity of Petroleum Waxes Compounded with Additives (Hot Melts)
ASTM D3244	Utilization of Test Data to Determine Conformance with Specifications
ASTM D3666	Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4402	Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer
ASTM D4552	Classifying Hot-Mix Recycling Agents
ASTM D5329	Sealants and Fillers, Hot-Applied, for Joints and Cracks in Asphalt Pavements and Portland Concrete Pavements
ASTM E1274	Measuring Pavement Roughness Using a Profilograph
ASTM E950	Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference
ASTM E2133	Using a Rolling Inclinator to Measure Longitudinal and Transverse Profiles of a Traveled Surface

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M 17	Mineral Filler for Bituminous Paving Mixtures
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- AASHTO M 156 Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
- AASHTO M 320 Performance-Graded Asphalt Binder
- AASHTO M 332 Performance-Graded Asphalt Binder Using Multiple Stress Creep Recovery (MSCR) Test
- AASHTO R 35 Superpave Volumetric Design for Asphalt Mixtures
- AASHTO T 96 Resistance to Degradation of Small-size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- AASHTO T 104 Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
- AASHTO T 195 Determining Degree of Particle Coating of Bituminous-Aggregate Mixtures
- AASHTO T 304 Uncompacted Void Content of Fine Aggregate
- AASHTO T 314 Determining the Fracture Properties of Asphalt Binder in Direct Tension (DT)
- AASHTO T 315 Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)
- AASHTO T 316 Viscosity Determination of Asphalt Binder Using Rotational Viscometer
- AASHTO T 327 Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus
- AASHTO T 350 Multiple Stress Creep Recovery (MSCR) Test of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)

Asphalt Institute (AI)

Asphalt Institute MS-2 Mix Design Manual, 7th Edition

ITEM P-609 CHIP SEAL COAT

DESCRIPTION

609-1.1 This item shall consist of a chip seal coat as a wearing course composed of a single or multiple application of liquid asphalt material and aggregate cover placed on the prepared primed base or properly cured wearing surface, according to these Specifications, and shall conform to the dimensions and typical cross section shown on the Plans.

609-1.2 QUANTITIES OF MATERIALS. The approximate amounts of materials per square yard for the chip seal shall be as provided in Table 609-1 for the treatment specified on the Plans. The exact amounts shall be provided to the Engineer for review and approval.

TABLE 609-1. QUANTITIES OF MATERIALS

Application No	Aggregate lbs/yd ²	Asphalt gal/yd ²	Type of Asphalt \1\
1	40-50	0.35-0.45	Asphalt Cement
		0.40-0.50	Emulsified Asphalt
2	20-25	0.15-0.25	Asphalt Cement
		0.20-0.35	Emulsified Asphalt
3	15-20	0.15-0.20	Emulsified Asphalt

\1\ See Table 609-4 for grades of asphalt and spraying temperatures.

MATERIALS

609-2.1 AGGREGATE MATERIALS. The aggregate material shall be either crushed stone or crushed gravel. The cover material shall be screenings; sand may be used when specified.

If the material is to be crushed stone, it shall be manufactured from sound, hard, durable rock of accepted quality and crushed to specification size. All strata, streaks, and pockets of clay, dirt, sandstone, soft rock, or other unsuitable material accompanying the sound rock shall be discarded and not allowed to enter the crusher.

If the material is to be crushed gravel, it shall consist of hard, durable, fragments of stone or gravel of accepted quality and crushed to specification size. All strata, streaks, and pockets of sand, excessively fine gravel, clay, or other unsuitable material including all stones, rocks, and boulders of inferior quality shall be discarded and not allowed to enter the crusher. When tested according to ATM 305, the crushing of the gravel shall result in a product in which the material retained on the separate No. 4, 3/8-inch, and 1/2-inch sieves shall have at least 90% of particles with at least one fractured face.

TABLE 609-2. AGGREGATE MATERIAL REQUIREMENTS

Material Test	Requirement	Standard
L.A. Wear	Loss: 40% maximum	AASHTO T 96
Soundness of Aggregates by Use of Sodium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate	AASHTO T 104
Micro-Deval	15% maximum	AASHTO T 327
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least one fractured faces ¹	ATM 305
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 3:1	ATM 306

¹ The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces. Fractured faces shall be achieved by crushing.

The crushed aggregate for the applications shall meet the requirements for gradation given in Table 609-3 when tested according to ATM 304.

TABLE 609-3. REQUIREMENTS FOR GRADATION OF AGGREGATE¹

Sieve Designation (square openings)	Percentage by Weight Passing Sieves		
	Aggregate No. 1	Aggregate No. 2	Aggregate No. 3
1 inch	100		
3/4 inch	90-100		
1/2 inch	20-55	100	
3/8 inch	0-15	85-100	100
No. 4	0-5	10-30	60-85
No. 8		0-10	0-25
No. 16		0-5	0-5
No. 200	0-1	0-1	0-2

¹ Locally available aggregate used for chip seals with similar gradations may be used provided the maximum aggregate size is the same; and the aggregate meets all other quality requirements in these specifications.

The gradations in the table represent the limits which shall determine suitability of aggregate for use for the specified applications from the sources of supply. The final gradations decided on, within the limits designated in the table, shall be uniformly graded from coarse to fine.

The aggregate to be used shall show no evidence of stripping or swell when tested according to according to ATM 414. The use of antistripping agents for the control of stripping shall be used if necessary.

609-2.2 ASPHALT MATERIAL. The types, grades, controlling specifications, and application temperatures for the asphalt materials are shown in Table 609-4. Provide the specific liquid asphalt material designated in the Plans.

TABLE 609-4. ASPHALT MATERIALS

Type and Grade	Specification	Spraying Temperature \1Deg. F
Asphalt Cement		
PG 52-28	AASHTO M 320	275+
Emulsified Asphalt		
RS-1	AASHTO M 140	70-140
RS-2	AASHTO M 140	125-175
MS-1, HFMS-1	AASHTO M 140	70-160
CRS-1	AASHTO M 208	125-175
CRS-2	AASHTO M 208	125-175
CRS-2P	AASHTO M 316	140-170

\1\ The maximum temperature for asphalt cements shall be below that at which fogging occurs.

The Contractor shall provide samples of the asphalt material and a copy of the manufacturer's Certificate of Analysis (COA) for each carload or equivalent of the asphalt material to the Engineer for review and

acceptance before the asphalt material is applied. If the asphalt emulsion is diluted at other than the manufacturer's facility, the Contractor shall provide a supplemental COA from an independent laboratory verifying the asphalt emulsion properties. The furnishing of COA for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

609-2.3 SAMPLING AND TESTING Sampling and testing is the responsibility of the Contractor. Sampling and testing shall be performed by an approved commercial testing laboratory, or by the Contractor, subject to approval by the Engineer. Sampling shall be according to ATM 301 for aggregates and ATM 401 for asphalt material, unless otherwise directed. Perform aggregate gradation tests on each sample according to ATM 304. Perform all other aggregate tests on the initial source samples and repeat tests when there is a change of source. Perform sieve analyses daily from material samples. The tests shall include an analysis of each gradation of material. Submit copies of test results to the engineer, within 24 hours after completion of each test.

CONSTRUCTION METHODS

609-3.1 WEATHER LIMITATIONS. Asphalt material shall be applied only when the existing surface is dry and the atmospheric temperature is above 60°F. No material shall be applied when rain is imminent or when dust or sand is blowing.

609-3.2 EQUIPMENT AND TOOLS. The Contractor shall furnish all equipment, tools, and machines necessary for the performance of the work.

- a. **Asphalt Distributor.** The distributor shall be designed, equipped, maintained, calibrated according to ASTM D2995, and operated so that asphalt material at even heat may be applied uniformly on variable widths of surface at the specified rate. The allowable variation from the specified rate shall not exceed 5%. Distributor equipment shall include a tachometer, pressure gages, volume-measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. The distributor shall be self-powered and shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically.
- b. **Aggregate Spreader.** The aggregate spreader shall be a self-propelled mechanical spreader or truck-attached mechanical spreader capable of uniformly distributing aggregate at the specified rates.
- c. **Power Rollers.** Power rollers shall be steel-wheeled or pneumatic-tired type, conforming to the following requirements:
 - (1) Steel-wheeled rollers shall have at least one steel drum and weigh a minimum of 5 tons. Steel wheels of the rollers shall be equipped with adjustable scrapers.
 - (2) Pneumatic-tired rollers shall be self-propelled and have wheels mounted on two axles in such manner that the rear tires will not follow in the tracks of the forward group. Tires shall be uniformly inflated to not less than 60 psi nor more than 80 psi pressure. The pneumatic-tired rollers shall be equipped with boxes or platforms for ballast loading and shall be loaded so that the tire print width of each wheel is not less than the clear distance between tire prints.
- d. **Power Broom.** A power broom and/or blower shall be provided for removing loose material from the surface to be treated.

609-3.3 PREPARING UNDERLYING COURSE. The surface of the underlying course shall be prepared, shaped, and conditioned to a uniform grade and section, as shown on the Plans and as specified. Loose dirt and other objectionable material shall be removed from the surface.

On those type of bases where a prime coat is required and specified, the prime shall be applied and satisfactorily cured before starting the asphalt surface treatment.

When specified, the Contractor shall be required to patch, with premixed material, any holes or other malformations deviating from the true cross section and grade. The premixed material shall be made of the asphalt material specified and prepared by the method directed by the Engineer. All small patches shall be thoroughly hand tamped while the large patches shall be rolled with a power or pneumatic roller.

609-3.4 CONTROL STRIP. Prior to providing a complete chip seal coat and in the presence of the Engineer, treat three lengths of at least 100-feet for the full width of the distributor bar. Use the appropriate typical application rates shown in Table 609-1 for one surface treatment trial. Make other chip seal coat trials using various amounts of materials, as required by the Engineer.

609-3.5 APPLICATION OF ASPHALT MATERIAL. Asphalt material shall be applied on the properly prepared surface at the rate and temperature specified using a pressure distributor to obtain uniform distribution at all points. To ensure proper drainage, the strips shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope. During all applications, the surfaces of adjacent structures shall be protected in such manner as to prevent their being spattered or marred. Asphalt materials shall not be discharged into borrow pits or gutters or upon the airport area.

609-3.6 APPLICATION OF AGGREGATE MATERIAL. Immediately after the application of the asphalt material, or as directed by the Engineer, uniformly spread the aggregates over the asphalt material at the rate specified for each designated application. Trucks spreading aggregate shall be operated backward so that the asphalt material will be covered before the truck wheels pass over it. The aggregate shall be spread in the same width of application as the asphalt material and shall not be applied in such thickness as to cause blanketing. Back-spotting or sprinkling of additional aggregate material, and pouring additional asphalt material over areas that show up having insufficient cover or asphalt, shall be done by hand whenever necessary. Additional spreading of aggregate material shall be done with a motor-patrol grader equipped with broom moldboard, a broom drag, kick broom, or a power broom, as directed by the Engineer.

Immediately after spreading each application, the aggregate shall be rolled. The rolling shall be continued until no more aggregate can be worked into the surface. In the construction of the second and third application, blading with the wire-broom moldboard attachment, kick broom, or broom dragging shall begin as soon as possible after the rolling has started and after the surface has set sufficiently to prevent excessive marking. Further blading and rolling on the strip being placed and on adjacent strips previously placed, shall be done as often as necessary to keep the aggregate material uniformly distributed. These operations shall be continued until the surface is evenly covered and cured to the satisfaction of the Engineer.

Succeeding applications shall not be applied until the preceding application has set and in no case until at least 24 hours have elapsed. If dust, dirt, or other foreign matter accumulates on the surface between the applications, the Contractor shall sweep and clean the surface as specified herein. The asphalt material and the aggregate shall be spread upon the clean and properly cured surface and handled as required. Avoid brooming or tracking dirt or any foreign matter on any portion of the pavement surface under construction.

All surplus aggregate from the final application shall be swept off the surface and removed prior to final acceptance of the work.

609-3.7 CORRECTION OF DEFECTS. Any defects, such as raveling, low centers, lack of uniformity, or other imperfections, shall be corrected to the satisfaction of the Engineer.

All defective materials resulting from over-heating, improper handling, or improper application shall be removed by the contractor and replaced with approved materials according to these specifications.

609-3.8 FREIGHT AND WAYBILLS. Before the final estimate is allowed the Contractor shall file with the Engineer receipted bills where railroad shipments are made, and certified waybills when materials are received in any other manner, of the asphalt and covering materials actually used in the construction covered by the contract. The Contractor shall not remove asphalt material from the tank car or storage tank

until the initial outage and temperature measurements have been taken by the Engineer, nor shall the car or tank be released until the final outage has been taken by the Engineer. Copies of all freight bills and waybills shall be furnished to the Engineer during the progress of the work.

METHOD OF MEASUREMENT

609-4.1 The asphalt material will be measured by the ton. Water added to emulsified asphalt will not be measured for payment.

609-4.2 The quantity of aggregate material for the first, second, and third application to be paid for will be the number of tons of aggregate used for the accepted work.

609-4.3 Chip Seal Coat, [number of aggregate] Applications. Section 90, by square yard of chip seal coat. Chip seal coat will be measured by the square yard, all preparation, materials, and application, completed and accepted. Liquid asphalt material, aggregate, blotter material, water used for aggregate and preparation, sweeping and dust control are subsidiary to P-609 items. Any areas of asphalt surface treatment found unacceptable by the Engineer shall be removed and reconstructed at the Contractor's expense. The pay unit/payment is for all layers/full depth of the surface treatment.

BASIS OF PAYMENT

609-5.1 Payment will be made at the contract unit price per ton for asphalt material for surface treatment and per ton for the first, second, and third aggregate application, or by the square yard for the completed chip seal coat application, as shown in the Bid Schedule.

Payment will be made under:

Item P609.010.0000	Asphalt Material – per ton
Item P609.020.0000	First Application Aggregate – per ton
Item P609.030.0000	Second Application Aggregate – per ton
Item P609.040.0000	Third Application Aggregate – per ton
Item P609.050.0000	Chip Seal Coat, ____ Applications – square yard.

REFERENCES

AASHTO M 140	Emulsified Asphalt
AASHTO M 208	Cationic Emulsified Asphalt
AASHTO M 320	Performance Graded Asphalt Binder
AASHTO T 96	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
AASHTO T 104	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
AASHTO T 327	Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus ATM 301 Sampling of Aggregates
ATM 304	Sieve Analysis of Aggregates & Soils
ATM 305	Percentage of Fracture in Coarse Aggregate
ATM 306	Percentage of Flat and Elongated Particles in Coarse Aggregate

ATM 401

Sampling Asphalt Materials

ATM 414

Anti-Strip Requirements of Hot Mix Asphalt

ITEM P-626 EMULSIFIED ASPHALT SLURRY SEAL SURFACE TREATMENT

DESCRIPTION

626-1.1 This item shall consist of a mixture of emulsified asphalt, polymer, mineral aggregate, and water properly proportioned, mixed, and spread on an asphalt pavement surface, including airport pavements serving airplanes of 12,500 lbs or less, roads, and other general applications. The application of the surface treatment shall be according to these Specifications and shall conform to the dimensions shown on the Plans or as directed by the Engineer.

626-1.2 ACRONYMS. Also see Subsection GCP-10-02.

ISSA International Slurry Surfacing Association, Washington, DC

MATERIALS

626-2.1 AGGREGATE. The aggregate shall consist of sound and durable manufactured sand, slag, crusher fines, crushed stone, or a combination thereof. The aggregate shall be clean and free from vegetable matter, dirt, and other deleterious substances. The aggregate shall have a sand equivalent of not less than 45 percent when tested according to ATM 307. The aggregate shall show a loss of not more than 35 percent when tested according to AASHTO T 96. The sodium sulfate soundness loss shall not exceed 12 percent, after 5 cycles when tested according to AASHTO T 104. Aggregates shall have a maximum Micro-Deval value of 15% when tested according to AASHTO T 327. Aggregate shall be 100% crushed.

The combined aggregate shall conform to the gradation shown in Table 626-1 when tested according to ATM 304. The specific aggregate gradation type will be designated in the Plans.

TABLE 626-1. GRADATION OF AGGREGATES

Sieve Size	Percent by Weight Passing Sieve		
	Type I	Type II	Type III
3/8 in.	100	100	100
No. 4	100	90 - 100	70 - 90
No. 8	90 - 100	65 - 90	45 - 70
No. 16	65 - 90	45 - 70	28 - 50
No. 30	40 - 65	30 - 50	19 - 34
No. 50	25 - 42	18 - 30	12 - 25
No. 100	15 - 30	10 - 21	7 - 18
No. 200	10 - 20	5 - 15	5 - 15
Residual asphalt content, percent dry weight of aggregate	10% - 16%	7.5% - 13.5%	6.5% - 12%

The job mix design (JMD) shall be run using aggregate within the gradation band for the desired type shown in Table 626-1. Once the JMD has been submitted and approved by the Engineer, the aggregate used on the project shall not vary by more than the tolerances shown in Table 626-2. At no time shall the aggregate used go out of the gradation bands in Table 626-1.

The aggregate will be accepted at the job location or stockpile. The aggregate will be accepted based on five gradation test samples according to ATM 301. If the average of the five tests is within the gradation tolerances, the materials will be accepted by the Engineer. If the tests show the material to be out of tolerance, the Contractor has the choice either to remove the material or blend other aggregates with the stockpile material to bring it into specification. Materials used in blending shall meet the quality tests before blending and shall be blended in a manner to produce a consistent gradation. This blending may require a new JMD.

Screening shall be required at the project stockpile site if there are oversize materials in the mix. Precautions shall be taken to prevent segregation of the aggregate in storing and handling. The stockpile shall be kept in areas that drain readily.

- a. **Aggregate Tolerance.** Once the JMD has been accepted, the aggregate gradation used on the project may vary from the aggregate gradation used in the JMD on each sieve by the percentages shown in Table 626-2. If the project aggregate fails to remain within this tolerance, a new JMD will be required by the Engineer at the expense of the Contractor.

TABLE 626-2. AGGREGATE TOLERANCE

Sieve Size	Tolerance, percent passing by weight
3/8 in.	± 5
No. 4	± 5
No. 8	± 5
No. 16	± 5
No. 30	± 5
No. 50	± 4
No. 100	± 3
No. 200	± 2
Residual Asphalt, percent dry weight of aggregate	± 1

626-2.2 MINERAL FILLER. If mineral filler, in addition to that naturally present in the aggregate, is necessary, it shall meet the requirements of AASHTO M 17 and shall be used in the amounts required by the JMD. The mineral filler shall be considered as part of the aggregate.

626-2.3 EMULSIFIED ASPHALT. The specific emulsified asphalt is designated in the Plans, and shall conform to the requirements of AASHTO R 5. The cement mixing test is waived for these slurry type emulsions. The type of emulsified asphalt shall be either anionic or cationic, whichever is best suited to the aggregate and job conditions to be encountered.

The Contractor shall provide samples of the emulsified material and a copy of the manufacturer's Certificate of Analysis (COA) for each carload or equivalent of the asphalt material to the Engineer for review and acceptance before the emulsified asphalt material is applied. The furnishing of COA for the emulsified asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

626-2.4 POLYMER. The Contractor shall submit manufacturer's technical data, the manufacturer's certification indicating that the polymer meets the requirements of the specification, and the asphalt material manufacturer's approval of its use to the Engineer.

626-2.4 WATER. All water used in mixing or curing the slurry shall be from potable sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

COMPOSITION AND APPLICATION

626-3.1 COMPOSITION. The slurry seal shall consist of a mixture of emulsified asphalt, mineral aggregate, a minimum of 1% polymer (when specified), additives as necessary, and water.

626-3.2 JOB MIX DESIGN. No slurry seal for payment shall be placed until a JMD has been approved by the Engineer. The JMD shall be developed by a laboratory with experience in designing slurry seal mixes and a signed copy shall be submitted in writing by the Contractor to the Engineer at least 10 days prior to the start of operations.

The laboratory report JMD shall indicate the proportions of aggregates, mineral filler (min. and max.), water (min. and max.), polymer (%), and asphalt emulsion based on the dry aggregate weight. It shall also report the quantitative effects of moisture content on the unit weight of the aggregate (bulking effects). The JMD shall be in effect until modified in writing by the Engineer. Should a change in sources of materials be made, a new JMD shall be established before the new material is used.

The Contractor shall submit to the Engineer for approval a complete JMD on the materials proposed for use, prepared and certified by an approved laboratory. Compatibility of the aggregate, emulsion, mineral filler, and other additives shall be verified by the JMD. The JMD shall be made with the same aggregate and grade of emulsified asphalt that the Contractor will provide on the project. At a minimum the required tests and values needed are shown in Table 626-3:

TABLE 626-3. SLURRY MIX TESTS

TEST	DESCRIPTION	SPECIFICATION
ISSA TB-100	Wet Track Abrasion of Slurry Surfacing Systems, One Hour Soak	50 g/ft ² Max
ISSA TB-115	Determination of Slurry Seal Compatibility	Pass

626-3.3 APPLICATION RATE. Unless otherwise specified, the slurry seal shall be applied to at the application rates shown in Table 626-4 for that gradation of material used. The rate of application shall not vary more than ± 2 lb/yd².

TABLE 626-4. SLURRY APPLICATION RATES
(Pounds of mixture per square yard)

Type I	Type II	Type III
8 - 12	12 - 20	18 - 30

626-3.4 CONTROL STRIPS. Control Strips, of 60 yd² each, shall be placed prior to the start of the slurry seal work in the presence of the Engineer. The test area will be designated by the Engineer and will be located on the existing pavement. Control strips shall be made by each machine after calibration. Samples of the slurry seal may be taken and the mix consistency verified by using ISSA TB-106 Slurry Seal Consistency test. In addition, the proportions of the individual materials may be verified by the Engineer by using the calibration information provided after machine calibration. If any test does not meet specification requirements, additional tests shall be made at the expense of the Contractor, until an acceptable control strip is placed.

CONSTRUCTION METHODS

626-4.1 WEATHER LIMITATIONS. The slurry seal shall not be applied if the pavement or air temperature is below 50°F and falling but may be applied when both pavement and air temperature are above 45°F and rising. No slurry seal shall be applied when there is danger that the finished product will freeze before 24 hours. Do not apply slurry seal during rain or other adverse weather conditions. The mixture shall not be applied when weather conditions prolong opening to traffic beyond a reasonable time.

626-4.2 EQUIPMENT AND TOOLS. The Contractor shall furnish all equipment, tools, and machinery necessary for the performance of this work.

- a. **Slurry Mixing Equipment.** The machine shall be specifically designed and manufactured to lay slurry seal. The material shall be mixed by a self-propelled slurry seal mixing machine of either truck mounted or continuous run design. Either type machine shall be able to accurately deliver and proportion the aggregate, emulsified asphalt, mineral filler, and water to a revolving mixer and discharge the mixed product on a continuous flow basis. The machine shall have sufficient storage capacity for materials to maintain an adequate supply to the proportioning controls.

If continuous run equipment is used, the machine shall be equipped to allow the operator to have full control of the forward and reverse speed of the machine during application of the slurry seal,

with a self-loading device, with opposite side driver stations, all part of original equipment manufacturer design.

The aggregate shall be pre-wetted immediately prior to mixing with the emulsion. The mixing unit of the mixing chamber shall be capable of thoroughly blending all ingredients. No excessive mixing shall be permitted. The mixing machine shall be equipped with a fines feeder that provides an accurate metering device or method to introduce a predetermined proportion of mineral filler into the mixer at the same time and location that the aggregate is fed into the mixer.

The mixing machine shall be equipped with a water pressure system and fog-type spray bar adequate for complete fogging of the surface with an application of 0.05 to 0.10 gal/yd² preceding the spreading equipment.

Sufficient machine storage capacity to mix properly and apply a minimum of 5 tons of the slurry shall be provided. Proportioning devices shall be calibrated prior to placing the slurry seal.

- b. Slurry Spreading Equipment.** The mixture shall be spread uniformly by means of a conventional surfacing spreader box attached to the mixer and equipped to agitate and spread the material evenly throughout the box. A front seal shall be provided to ensure no loss of the mixture at the surface contact point. The rear seal shall act as the final strike-off and shall be adjustable. The spreader box and rear strike-off shall be so designed and operated to produce a free flow of material of uniform consistency to the rear strike-off. The spreader box shall have suitable means provided to side shift the box to compensate for variations in the pavement geometry. A burlap drag or other approved screed may be attached to the rear of the spreader box to provide a uniform mat.

A continuous spreading operation shall be maintained by means of a continuous charging operation so that a minimum of construction joints occur. Continuous operating is defined as one in which the spreading operation progresses prior to initial setting or breaking of the slurry mix, which starts within approximately 15 minutes.

Provide suitable storage facilities for the asphalt emulsion, using containers equipped to prevent water from entering the emulsion. If necessary, suitable heat shall be provided to prevent freezing.

- c. Auxiliary Equipment.** Other tools or equipment such as brushes, hand squeegees, hose equipment, tank trucks, water distributors and flushers, power blowers, barricades, etc., shall be provided as required.
- d. Roller.** The roller shall be a self-propelled pneumatic-tired roller capable of exerting a contact pressure during rolling of 50 psi. It shall be equipped with a water spray system, to be used if the slurry is picking up on the tires during rolling.
- e. Tack Coat and Distributor.** Normally a tack coat is not required unless the surface to be covered is extremely dry and raveled or is concrete or brick. If required, the tack coat should consist of one part emulsified asphalt and three parts water. The emulsified asphalt may be the same as that used in the mix. Pressure distributors used for application of the diluted asphalt emulsion tack coat shall be self-propelled, equipped with pneumatic tires, and capable of uniformly applying 0.05 to 0.15 gal/yd² of the diluted emulsion over the required width of application. Distributors shall be equipped with tachometers, pressure gages, and volume-measuring devices. The tack coat shall be applied at least 2 hours before the slurry seal but within the same day.

626-4.3 EQUIPMENT CALIBRATION. Each slurry mixing unit to be used on the project shall be calibrated in the presence of the Engineer prior to construction. Previous calibration documentation covering the exact materials to be used may be accepted by the Engineer provided they were made during the calendar year. The documentation shall include an individual calibration of each material at various settings, which can be related to the machine's metering devices. No machine will be allowed to work on the project until either the calibration has been completed or a previous calibration is accepted by the Engineer.

626-4.4 PREPARATION OF EXISTING SURFACE. Clean pavement surface immediately prior to placing the tack coat and slurry seal coat by sweeping, flushing well with water leaving no standing water, or a combination of both, so that the pavement surface is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film. Remove oil or grease that has not penetrated the asphalt pavement by scraping or by scrubbing with a detergent, then wash thoroughly with clean water. Water flushing will not be permitted in areas where considerable cracks are present in the pavement surface. After cleaning, treat these areas with an oil spot primer.

All painted stripes or markings on the surface to be treated, shall be removed according to Subsection P-620-3.3. Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt pavement similar to that of the existing pavement. Materials and methods of construction shall comply with the applicable sections of these specifications. Remove all vegetation and debris from cracks to a minimum depth of 1-inch. If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the Engineer. Fill all cracks greater than 1/4-inch (wide) with a crack sealant meeting ASTM D6690, Type IV. The crack sealant, preparation, and application shall be compatible with the surface treatment/overlay to be used. To minimize contamination of the asphalt with the crack sealant, underfill the crack sealant a minimum of 1/8-inch, not to exceed 1/4-inch. Any excess joint or crack sealant shall be removed from the pavement surface.

626-4.5 APPLICATION OF SLURRY SEAL COAT. Charge the mixture in the following order:

- a. Water
- b. Aggregate
- c. Asphalt Emulsion

No violent mixing will be permitted. Maintain temperature range at the mixer between 90 and 120 °F. Mix until a uniform coating of the aggregate is obtained. Continue mixing until the mixture is discharged into the spreader box. Discard the entire batch if there is evidence that the emulsion has broken.

The surface shall be pre-wet by fogging ahead of the slurry spreader box. Water used in pre-wetting the surface shall be applied at such a rate that the entire surface is damp with no apparent flowing water in front of the slurry spreader box. The slurry mixture shall be of the desired consistency when deposited on the surface, and no additional elements shall be added. Total time of mixing shall not exceed 2 minutes. A sufficient amount of slurry shall be carried in all parts of the spreader box at all times so that complete coverage of all surface voids and cracks is obtained. Care shall be taken not to overload the spreader box which shall be towed at a slow and uniform rate not to exceed 5 mph. No lumping, balling, or unmixed aggregate shall be permitted. No segregation of the emulsion and fines from the coarse aggregate will be permitted. If the coarse aggregate settles to the bottom of the mix, the slurry shall be removed from the pavement surface. A sufficient amount of slurry shall be fed into the box to keep a full supply against the full width of the spreader box. The mixture shall not be permitted to overflow the sides of the spreader box. No breaking of the emulsion will be allowed in the spreader box.

Apply the slurry seal to form a film with a maximum thickness of 3/8 inch. Isolated depressions and cracks may have a thickness greater than 3/8 inch in order to obtain a smooth surface.

The finished surface shall have no more than 4 tear or drag marks greater than 1/2 inch wide and 4 inches long in any 12 foot by 22 foot section. It shall have no tear or drag marks greater than 1 inch wide and 3 inches long.

The finished surface shall have no transverse ripples of 1/4 inch or more in depth, as measured with a 12-foot straight edge laid upon the surface.

Adjacent lanes shall be lapped at the edges a minimum of 2 inches with a maximum of 4 inches to provide complete sealing at the overlap. Construction longitudinal and transverse joints shall be neat and uniform

without buildup, uncovered areas, or unsightly appearance. All joints shall have no more than 1/4 inch difference in elevation when measured across with a 12-foot straight edge.

After application of the slurry seal, the surface shall be rolled with a pneumatic-tired roller a minimum of 2 complete passes. The roller shall be operated at a tire pressure of approximately 50 psi.

The fresh slurry seal application shall be protected by barricades and markers and permitted to dry for 4 to 24 hours, depending on weather conditions. Any damage to uncured slurry shall be repaired at the expense of the Contractor.

In areas where the spreader box cannot be used, the slurry shall be applied by means of a hand squeegee. Upon completion of the work, the seal coat shall have no holes, bare spots, or cracks through which liquids or foreign matter could penetrate to the underlying pavement. The finished surface shall present a uniform and skid resistant texture satisfactory to the Engineer. All wasted and unused material and all debris shall be removed from the site prior to final acceptance.

Upon completion of the project, the Contractor shall sweep the finished surface with a conventional power rotary broom, to remove any potential loose material from the surface. The material removed by sweeping shall be disposed of in a manner satisfactory to the Engineer.

626-4.6 CERTIFICATION. Samples of the emulsion that the Contractor proposes to use, together with a statement as to its source, shall be submitted, and approval shall be obtained before using such material. The Contractor shall submit to the Engineer a manufacturer's certified report for each consignment of the emulsion. The manufacturer's certified report shall not be interpreted as a basis for final acceptance. All such reports shall be subject to verification by testing samples of the emulsion as received for use on the project.

METHOD OF MEASUREMENT

626-5.1 The emulsified asphalt for slurry coat will be measured by the square yard.

626-5.2 Aggregate will be measured by the ton of dry aggregate.

626-5.3 Tack coat will be measured by the ton.

626-5.4 Emulsified Asphalt Slurry Seal Surface Treatment will be measured according to Section 90 by the square yard, all preparation, materials, and application, completed and accepted. Liquid asphalt material, aggregate, blotter material, water used for emulsion and preparation, sweeping and dust control are subsidiary to the work. Any areas of emulsified asphalt slurry seal surface treatment found unacceptable by the Engineer shall be removed and reconstructed at the Contractor's expense. The pay unit/payment is for all layers/full depth of slurry seal surface treatment.

BASIS OF PAYMENT

626-6.1 Payment will be made at the contract unit price per square yard for the slurry coat and at the contract price per ton for aggregate and tack coat.

Payment will be made under:

Item P626.010.0000	Emulsified Asphalt for Slurry Coat - per square yard
Item P626.020.0000	Aggregate - per ton
Item P626.030.0000	Emulsified Asphalt for Tack Coat - per ton
Item P626.040.0000	Emulsified Asphalt Slurry Seal Surface Treatment – per square yard

REFERENCES

AASHTO M 17

Mineral Filler for Bituminous Paving Mixtures

AASHTO R 5	Selection and Use of Emulsified Asphalts
AASHTO T 96	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
AASHTO T 104	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
AASHTO T 327	Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus
ASTM C1602	Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D6690	Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
ATM 301	WAQTC FOP for AASHTO T 2 Sampling of Aggregates
ATM 304	WAQTC FOP for AASHTO T 27/T 11 Sieve Analysis of Fine and Coarse Aggregates
ATM 307	WAQTC FOP for AASHTO T 176 Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
ISSA TB-100	Wet Track Abrasion of Slurry Surfacing Systems
ISSA TB-106	Measurement of Slurry Seal Consistency
ISSA TB-115	Determination of Slurry System Compatibility

ITEM P-636 HIGH FLOAT SURFACE TREATMENT

DESCRIPTION

636-1.1 Construct a single course asphalt surface treatment (HFST).

MATERIALS

636-2.1 EMULSIFIED ASPHALT. Use HFMS-2s high float asphalt emulsion material that conforms to AASHTO M 140.

636-2.2 AGGREGATES. Use crushed stone or crushed gravel for cover coat material (cover aggregate) consisting of sound, tough, durable pebbles or rock fragments of uniform quality. Use material free from clay balls, vegetable matter, adherent films or coatings of dirt, clay, dust, or other deleterious matter that could impede adherence of the asphalt material. Wash the aggregate if necessary. Meet the following requirements:

L.A. Wear, %	AASHTO T 96	50, max.
Micro-Deval, %	AASHTO T 327	15, max.
Sodium Sulfate Loss, %	AASHTO T 104	9, max. (5 cycles)
Fracture, %	ATM 305	50, min. (single face)
Thin-Elongated Pieces	ATM 306	8, max.
Plasticity Index*	AASHTO T 90	3 max.

*Prepare material for AASHTO T 90 according to the wet preparation method, AASHTO T 146.

The test sampling locations(s) will be determined by the Engineer, before crushing operations begin. Cover stockpiles of cover coat material to exclude precipitation.

a. Gradation testing:

- (1) **Acceptance Testing:** Determine the gradation by AASHTO T 27. Testing will be done upon notification by the Contractor that the crusher is ready for production.
- (2) **Assurance Testing:** Determine the gradation by AASHTO T 27 and AASHTO T 88 except dry the material for the T 88 test within a temperature range of 90° to 100° F.

At least 15 days before beginning work, submit a representative 30-pound sample of the aggregate and 1-quart sample of the asphalt material proposed for use in the work. The Department will test the materials using ATM 414 as submitted (that is, without addition of anti-stripping additives). The Department will reject materials failing to meet or exceed 70% retention of the asphalt, unless you provide approved anti-stripping additives or employ other approved measures which correct this deficiency.

**TABLE 636-1
REQUIREMENTS FOR GRADING OF COVER AGGREGATE
FOR HIGH FLOAT SURFACE TREATMENT**

Sieve	Percent Passing by Weight
1 in.	100
3/4 in.	75-95
3/8 in.	50-80
No. 4	35-65
No. 8	20-50
No. 40	8-30
No. 200	0-5
0.005 mm	0-3*

** Special Note on Gradation Testing: For acceptance testing, verify compliance with the minus 0.005 mm size fraction at least once for each source used. For assurance testing, use the entire gradation with each test.*

636-2.3 SURFACE TREATMENT BLOTTER MATERIAL. Use suitable, clean sand. Unless otherwise required by the Engineer, use sand passing the 8 mesh sieve, and having no more than 0.5% material passing the 200 mesh sieve. The material may be accepted in stockpile at the source. Gradation will be determined by AASHTO T-27.

636-2.4 DETERMINE HFST DESIGN COMPOSITION. Within two days after the start of cover aggregate crushing, submit a representative 70 lb sample of the cover aggregate and a 1 gallon sample of the high float asphalt emulsion proposed for use on the project. Fill the asphalt container to the brim so that it contains no air.

Submit changes in application rates warranted by changes in aggregate gradation, source of cover aggregate, or high float emulsion supplier in the same manner as the-original submittal.

636-2.5 COMPOSITION OF SURFACE TREATMENT. The initial application rates of asphalt and cover aggregate materials will be as determined by the Engineer per subsection 636-2.4. The Engineer may adjust application rates as required by field conditions.

The following table provides the pre HFST Design estimating factors, and specifies the tolerance allowed the Contractor for applying surface treatment material above or below the application rates determined by the Engineer.

Material	Pre-HFST Design Estimating Factor	Specified Tolerance
HFMS-2S Asphalt	0.75 gallon per sq. yard	±0.04 gallon per sq. yard
Cover Aggregate	75 lb per sq. yard	±3 lb per sq. yard

CONSTRUCTION REQUIREMENTS

636-3.1 GENERAL. Longitudinal joints are allowed only at the centerline. Accomplish work in a manner such that asphalt and cover aggregate applications are completed full width by the end of each shift.

636-3.2 WEATHER LIMITATIONS. Proceed only if ambient air temperature is 60°F or above. Measure temperatures in the shade away from any heat source.

Do not apply HFST during periods of rain, fog, mist or imminent rain or when weather conditions prevent the proper penetration of the asphalt material and/or adhesion of the cover aggregate.

Ensure that weather conditions allow for proper construction of the HFST and adequate curing time prior to inclement weather or freeze-up. Do not apply HFST before May 15 or after August 15.

636-3.3 EQUIPMENT.

- a. **Distributor.** Use a distributor that is designed, equipped, maintained and operated so that asphalt material at even heat is applied uniformly on variable widths of surface up to half the roadway, runway, or taxiway width plus 6 inches, at the specified rate, from 0.38 to 0.75 gallons per square yard, with uniform pressure and within specified tolerances.

Provide distributor equipment that meets the following:

- (1) Computerized control of liquid asphalt spread rates to automatically deliver specified delivery rates and capable of changing rates when so directed. Computer monitoring of spread rate, truck speed and distance traveled.

- (2) A thermometer for measuring temperatures of the tank's contents, readily visible from outside the truck cab.
- (3) Each nozzle in the spray bar is turned to make the constant angle with the longitudinal axis of the spray bar that is recommended by the manufacturer of the distributor. All nozzles in the spray bar are of the same manufacture, type and size. The spray bar height provides triple overlap of the asphalt emulsion being applied by the spray nozzles.

Before the application of asphalt, ensure that the distributor meets the following requirements:

- (1) The spray bar can be maintained at a constant height throughout the entire operation.
- (2) Spray bar nozzles are clean and in good working condition.
- (3) The spray bar is provided with a positive shutoff to prevent dribbling.
- (4) The distributor is capable of maintaining a uniform speed.

Calibration and adjustment requirements include:

- (1) The distributor will be inspected by the Engineer prior to the commencement of the operation. Perform any adjustments, maintenance and other requirements prior to use.
 - (2) Calibrate the distributor in accordance with the manufacturer's recommendations. The Engineer may require the Contractor to prove the accuracy of the distributor prior to commencing the asphalt application and any time thereafter if deemed necessary by the Engineer. Any change in settings on the distributor after calibrating will require that the distributor be recalibrated.
 - (3) Should any of the nozzles on the spray bar fail to provide a constant, uniform flow during the application of asphalt material, immediately cease application of the asphalt material. Do not allow the distributor to resume application of the asphalt material until all of the nozzles are in good working order. Nozzle adjustments and/or repairs must be approved by the Engineer.
- b. **Aggregate Spreader.** Provide an aggregate spreader that is capable of evenly applying cover aggregate material to the specified roadway, runway, or taxiway width in a maximum of two passes. Provide an aggregate spreader that is computer controlled to automatically maintain the specified delivery rate of cover aggregate regardless of variations in machine speed. Provide a spreader with sufficient size feed system to maintain cover aggregate in the spread hopper at all times. Provide a spread hopper that is equipped with augers or other approved equipment to prevent segregation of the cover aggregate materials.

Stopping the aggregate spreader to refill the receiving hopper will be permitted provided that the spreader is backed up at least 20 feet from the last cover aggregate application. The aggregate spreader will be permitted to slow down to allow trucks to backup and discharge loads into the receiving hopper. Provide an aggregate spreader that is constructed to eliminate material segregation in the various hoppers.

Immediately before using the aggregate spreader on the project, calibrate the aggregate spreader for the cover aggregate to be applied. Control the forward speed of the aggregate spreader during calibration to approximate the speed required to apply the cover aggregate over the asphalt material and maintain a continuous operation with the distributor. Calibrate the aggregate spreader in accordance with the manufacturer's recommendations. The Engineer may require the Contractor to prove the accuracy of the aggregate spreader.

Calibrate the aggregate spreader whenever directed by the Engineer and allow the Engineer to observe the procedure.

- c. **Rollers.** Utilize a minimum of three self-propelled pneumatic rollers weighing not less than 20,000 lbs, equipped with not less than nine tires staggered back and front, inflated to 60 psi. Inflate all tires to equal pressure, and equip each roller with a suitable tire pressure gauge for checking tire inflation pressure.

636-3.4 PREPARATION OF SURFACE. Apply HFST on sections of fully shaped and compacted grade. Allow the Engineer to approve grade prior to application of HFST. Apply HFST within 72 hours of approval of the grade. Areas of grade not surfaced within the 72 hour period are subject to reapproval by the Engineer. Roll the surface with a steel wheeled soil compactor immediately prior to application of asphalt materials. Do not leave windrows of materials that may impede drainage on or adjacent to the surface treatment area.

Apply HFST when the prepared surface is damp. Prior to the asphalt application, the Engineer may require dampening the surface by applying a fine spray of water to the prepared surface. Do not apply HFST to a wet surface or when rain or fog is present or imminent.

636-3.5 APPLYING HIGH FLOAT ASPHALT EMULSION MATERIAL. Ensure that the length of spread of high float asphalt emulsion (hereafter referred to as asphalt) material does not exceed that which trucks loaded with cover aggregate can immediately cover.

For the first pass over the segment of roadway, runway, or taxiway being surfaced, follow a string line, set either on the shoulder or on the centerline, whichever is on the driver's side of the distributor. Accomplish the second pass with the centerline joint on the driver's side of the distributor.

Do not allow any equipment or vehicles on sprayed asphalt at any time prior to cover aggregate application.

Do not spread asphalt material more than 6 inches wider than the width covered by the cover aggregate from the spreader. Do not allow operations to proceed in a manner that allows asphalt material to chill, set up, dry, or otherwise impair retention of the cover aggregate.

Park the distributor, when not spreading, so that the spray bar or mechanism will not drip asphalt material on the surface of the roadway, runway, or taxiway.

Apply asphalt material at temperatures between 150°F and 180°F.

Correct any skipped areas or deficiencies. Prevent an excess of asphalt material at junctions of spreads.

636-3.6 APPLICATION OF COVER AGGREGATE MATERIAL. Provide cover aggregate that has a temperature of no less than 40°F and a 3%-5% moisture content (by dry weight) at the time of application. If necessary, the cover aggregate shall be moistened or dried to achieve the specified moisture content.

Apply cover aggregate within 1.5 minutes after application of the asphalt material or as directed by the Engineer. Keep the increment as constant as possible, and adjust as needed to meet changing conditions. Whenever it is apparent that the time limit above will be exceeded, make a transverse joint by placing construction paper (roofing felt or similar product) on the prepared surface and ending the HFST operations on the paper. Remove the paper and dispose of properly. Touch up the edges of the applied HFST prior to restarting HFST operations.

Immediately after cover aggregate is spread, cover deficient areas with additional material. Begin pneumatic tire rolling for the full width of the aggregate immediately after placement of cover aggregate and continue until at least six complete coverages are obtained or until cover aggregate is bound tightly, to the satisfaction of the Engineer. Accomplish the rolling operation within 500 feet of the cover aggregate application. Slow the high float application operation if the rolling cannot be completed within this distance. Do not exceed 5 miles per hour with the pneumatic tire roller. Maintain a spare pneumatic tired roller on the project during high float application, in addition to those rollers necessary to accomplish this specification.

Accomplish spreading in such a manner that the tires of the trucks or aggregate spreader do not contact the uncovered and newly applied asphalt material.

Sweeping to remove excess cover aggregate is required. Sweep between two and three weeks following the application of cover coat material as directed by the Engineer. Remove ridges of loose aggregate created by traffic prior to sweeping, or uniformly spread ridges over the surface as they develop as directed by the Engineer.

636-3.7 APPLICATION OF BLOTTER MATERIAL. Due to weather, construction and/or materials problems, it is possible that the finished surface treatment may become unstable. To minimize development of damage to the surface, blotter material may be required. Apply blotter material as directed by the Engineer and immediately roll with a pneumatic-tired roller (as described above) with tire pressures adjusted to 90-100 psi.

636-3.8 TRAFFIC CONTROL. Do not operate construction equipment at speeds exceeding 15 miles per hour on a freshly applied surface treatment, for a period of up to 24 hours, as directed by the Engineer. Unless otherwise specified, keep public corridors open to traffic at all times. Do not allow traffic on freshly sprayed asphalt or cover aggregate material that is not fully compacted. As soon as final rolling of the HFST layer is accomplished, controlled traffic may be permitted to operate on the HFST surface. Control public traffic on the HFST so that speeds do not exceeding 15 miles per hour for a period of 12 hours or as directed by the Engineer.

METHOD OF MEASUREMENT

636-4.1 See Section 90.

Surface Treatment Blotter Material and water used for aggregate and surface preparation are not measured for payment; these items are considered subsidiary obligations.

If sweeping and/or blading of excess cover aggregate is required, this work is not measured or paid for directly, but is considered a subsidiary obligation.

BASIS OF PAYMENT

636-5.1 Water for emulsified asphalt is subsidiary.

Payment will be made under:

Item P636.010.0000	Asphalt for High Float Surface Treatment, Type HFMS-2s – per ton
Item P636.020.0000	Aggregate for High Float Surface Treatment, Grading B – per ton
Item P636.030.0000	High Float Surface Treatment – per square yard
Item P636.040.0000	Aggregate for High Float Surface Treatment – per cubic yard

REFERENCES

AASHTO M 140	Emulsified Asphalt
AASHTO T 27	Sieve Analysis of Fine and Coarse Aggregates
AASHTO T 88	Particle Size Analysis of Soils
AASHTO T 90	Plastic Limit and Plasticity Index of Soils
AASHTO T 96	Resistance to Degradation of Small-size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
AASHTO T 104	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
AASHTO T 146	Wet Preparation of Disturbed Soil Samples for Test
AASHTO T 327	Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus
ATM 305	Percentage of Fracture in Coarse Aggregate

ATM 306

Determining the Percentage of Flat and Elongated Particles in Coarse Aggregate (Alaska FOP for ASTM D 4791)

ATM 414

Anti-Strip Requirements of Hot Mix Asphalt

ITEM P-640 SEGMENTED CIRCLE

DESCRIPTION

640-1.1 This item consists of furnishing and installing an airport segmented circle, according to the dimensions, design, details, and location shown on the Plans. Construct barrel-type or panel-type, as shown in the bid schedule.

If shown on the Plans, the segmented circle includes landing direction indicator, landing strip indicators, or traffic pattern indicators.

MATERIALS

640-2.1 BARREL-TYPE.

- a. **Barrels.** Cylindrical, steel, 55-gallon, undamaged, contaminant-free, and rust-free.
- b. **Primer Paint.** Zinc Oxide, raw linseed oil, and alkyd primer, meeting SSPC-Paint 25.
- c. **Finish Paint.** Aviation Gloss Orange, No. 12197, meeting Federal Standard 595.

640-2.2 PANEL-TYPE.

- a. **Panels.** Sheet aluminum with a reflective covering and meeting the following requirements:
 - (1) Use 0.080-inch thick, alloy 6061-T6, 5052-H36, 5052-H38, or recycled aluminum meeting alloy 3105, as specified in ASTM B209.
 - (2) Make each panel a continuous sheet for the length and width shown on the Plans. Furnish panels that are cut to size and shape and free of buckles, warp, dents, cockles, burrs and any other defects resulting from fabrication. Complete all possible fabrication including shearing, cutting and hole punching prior to preparing the base metal for painting and application of reflective sheeting.
 - (3) Treat the aluminum base metal sheets with coating for aluminum conforming to the requirements of ASTM B921, Class 2. After cleaning and coating operations, protect the panels at all times from contact or exposure to greases, oils, dust or other contaminants.
 - (4) Prepare both sides of each panel and cover with orange retroreflective sheeting, meeting the requirements of ASTM D4956, Type IV, as recommended by the manufacturer in the configuration shown on the plans.
- b. **Frames.** Perforated, galvanized, square steel tubing with the dimensions shown on the Plans and meeting the following requirements:
 - (1) Fabricate square tube with cold-rolled carbon steel sheets, 12 gage, commercial quality, meeting ASTM A653, coating designation G 90. Form tubes, roll to size, and continuously weld for the entire length.
 - (2) Perforate all members for their entire length with 7/16-inch diameter holes on 1-inch centers.
 - (3) Furnish members that are straight and with a smooth, uniform finish with no splices.
 - (4) Ensure that all perforations and cut off ends are free from burrs.
- c. **Hardware and Fasteners.** Hardware and fasteners shall meet the following requirements:
 - (1) Gusset and splice plates shall be 1/4-inch thick steel, ASTM A36, galvanized.

- (2) Fasteners shall be hot dip galvanized, Grade 2, 3/8-inch diameter bolts; with two 1-inch diameter washers and one nut, each bolt. Provide bolt lengths as required to fasten members.

CONSTRUCTION METHODS

640-3.1 GENERAL. The site may be either on a prepared pad constructed for that purpose under separate item or on natural ground, whichever is shown on the Plans.

If the segmented circle is to be placed on original ground, clear the site of all brush and vegetation to the limits shown on the Plans and level the site.

Use material excavated for installation of barrels or stanchions as backfill. Spread excess material evenly over ground adjacent to the barrels, stanchions, or pad so as to leave the site in a neat condition.

640-3.2 BARREL-TYPE. Clean the outside of each barrel with an approved solvent and paint with 1 coat of primer paint and 2 coats of finish paint.

Cut hole maximum of 6 inches in bottom of barrel. Fill barrel one third with clean sand or gravel. Bury the bottom one third of barrel at the location and in the configuration shown on the Plans.

640-3.3 PANEL-TYPE. Prepare and assemble panels, perforated steel tubes, and hardware as shown in the Plans. Bury stanchions to the depth, at the location, and in the configuration shown on the Plans.

METHOD OF MEASUREMENT

640-4.1 Segmented circle will not be measured for payment.

BASIS OF PAYMENT

640-5.1 Payment will be made at the contract lump sum price shown on the bid schedule. Clearing of the site is paid for under Item P-151 Clearing and Grubbing. If Item P-151 is not included in the bid schedule, clearing is subsidiary.

Payment will be made under:

Item P640.010.0000	Segmented Circle (Barrel-Type) – per lump sum
Item P640.020.0000	Segmented Circle (Panel-Type) – per lump sum

REFERENCES

ASTM A36	Structural Steel
ASTM A653	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM B209	Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B921	Standard Specification for Non-hexavalent Chromium Conversion Coatings on Aluminum and Aluminum Alloys
ASTM D4956	Standard Specification for Retroreflective Sheeting for Traffic Control
Federal Standard 595	Colors Used in Government Procurement
SSPC – Paint 25	Specification for Zinc Oxide, Raw Linseed Oil, and Alkyd Primer (Without Lead and Chromate Pigments)

ITEM P-641 EROSION, SEDIMENT, AND POLLUTION CONTROL

641-1.1 DESCRIPTION. Provide project administration and work relating to control of erosion, sedimentation, and discharge of pollutants, according to this section and applicable local, state, and federal requirements, including the Alaska Pollution Discharge Elimination System (APDES) Construction General Permit (CGP). The state APDES program is administered by the Department of Environmental Conservation (DEC). Section 301(a) of the Clean Water Act (CWA) and 18 AAC 83.015 provide that the discharge of pollutants to water of the U.S. is unlawful except as allowed by the CGP.

Temporary erosion control measures shall be in accordance with the Erosion and Sediment Control Plan; the approved Construction Safety and Phasing Plan (CSPP), and AC 150/5370-2, *Operational Safety on Airports During Construction*. The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary erosion and sediment control measures may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites, when such areas are included in the Project Zone.

Temporary control measures shall be designed, installed and maintained:

- a. outside of safety areas of active runways and taxiways, and
- b. to minimize the creation of wildlife attractants that have the potential to attract hazardous wildlife on or near airports.

DEFINITIONS AND TERMS

641-1.2 These definitions apply only to Item P-641.

ACTIVE TREATMENT SYSTEM (ATS) OPERATOR. See CGP Appendix C.

ALASKA CERTIFIED EROSION AND SEDIMENT CONTROL LEAD (AK-CESCL). A person who has completed training, testing, and other requirements of, and is currently certified as, an AK-CESCL from an AK-CESCL Training Program (a program developed under a Memorandum of Understanding between the Department and others). The Department recognizes AK-CESCLs as “qualified personnel” required by the CGP. An AK-CESCL must be recertified every three years. (See Qualified Person).

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION (DEC). The state agency authorized by EPA to administer the Clean Water Act’s National Pollutant Discharge Elimination System.

ALASKA GENERAL PERMIT FOR EXCAVATION, DEWATERING (Excavation Dewatering Permit). The permit authorizing excavation dewatering discharges from Construction Activities.

ALASKA MULTI-SECTOR GENERAL PERMIT (MSGP). The permit authorizing stormwater discharges associated with Industrial Activity.

ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM (APDES). A system administered by DEC that issues and tracks permits for stormwater discharges.

BEST MANAGEMENT PRACTICES (BMPS). See CGP Appendix C.

CLEAN WATER ACT (CWA). Federal Water Pollution Control Amendments of 1972, as amended (33 U.S.C. 1251 et seq.).

CONSTRUCTION ACTIVITY. Ground disturbing activity by the contractor, subcontractor or utility company; that may result in erosion, sedimentation, or a discharge of pollutants into stormwater. See CGP Appendix C.

CONSTRUCTION GENERAL PERMIT (CGP). The permit authorizing stormwater discharges from Construction Activities, issued and enforced by Alaska DEC. It authorizes stormwater discharges providing permit conditions and water quality standards are met.

U.S. ARMY CORPS OF ENGINEERS PERMIT (COE PERMIT). A COE permit for construction in waters of the U.S. May be issued under Section 10 of the Rivers and Harbors Act of 1899, or Section 404 of the Clean Water Act.

ELECTRONIC NOTICE OF INTENT (ENOI). See CGP Appendix C.

ELECTRONIC NOTICE OF TERMINATION (ENOT). See CGP Appendix C.

ENVIRONMENTAL PROTECTION AGENCY (EPA). The federal agency charged to protect human health and the environment.

ERODIBLE STOCKPILE. Any material storage area or stockpile consisting of mineral aggregate, organic material, or a combination thereof, with greater than 5 percent passing the #200 sieve, and any material storage where wind or water transports sediments or other pollutants from the stockpile. Erodible Stockpile also includes any material storage area or stockpile, where the Engineer determines there is potential for wind or water transport, of sediments or other pollutants away from the stockpile.

EROSION AND SEDIMENT CONTROL PLAN (ESCP). The Department's project specific document that illustrates measures to control erosion and sediment on the project. The ESCP provides bidders with the basis for cost estimating and guidance for developing an acceptable Storm Water Pollutant Prevention Plan (SWPPP).

FINAL STABILIZATION. See CGP, Appendix C, "Stabilization."

HAZARDOUS MATERIAL CONTROL PLAN (HMCP). The Contractor's detailed project specific plan for prevention of pollution from storage, use, transfer, containment, cleanup, and disposal of hazardous material (including, but are not limited to, petroleum products related to construction activities and equipment). The HMCP is included as an appendix to the SWPPP.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT. A DEC stormwater discharge permit issued to certain local governments and other public bodies, for operation of stormwater conveyances and drainage systems. See CGP Appendix C.

OPERATOR(S). The party(s) responsible to obtain CGP permit coverage. CGP, Appendix C.

- a. Contractor – the Contractor is an Operator inside and outside the Project Zone.
- b. Department – the Department is an Operator inside the Project Zone.

POLLUTANT. Any substance or item meeting the definition of pollutant contained in 40 CFR § 122.2. A partial listing from this definition includes: dredged spoil, solid waste, sediment, sewage, garbage, sewage sludge, chemical wastes, biological materials, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

PROJECT ZONE. The physical area provided by the Department for Construction. The Project Zone includes the area of airport property or facility under construction, project staging and equipment areas, and material and disposal sites; when those areas, routes and sites, are provided by the Contract.

Material sites, material processing sites, disposal sites, haul routes, staging and equipment storage areas; that are furnished by the Contractor or a commercial operator, are not included in the Project Zone.

QUALIFIED PERSON. See CGP Appendix C and Subsection 641-1.4.

SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN (SPCC PLAN). The Contractor's detailed plan for petroleum spill prevention and control measures that meet the requirements of 40 CFR 112.

SPILL RESPONSE FIELD REPRESENTATIVE. The Contractor's representative with authority and responsibility for managing, implementing, and executing the HMCP and SPCC Plan.

STORM EVENT. See CGP Appendix C.

STORM WATER POLLUTION PREVENTION PLAN TWO (SWPPP2). The Contractor's plan for compliance with both the CGP and MSGP construction activities outside the Project Zone.

SUPERINTENDENT. The Contractor's duly authorized representative with authority and responsibility for the overall operation of the Project, and Contractor furnished sites and facilities.

SWPPP AMENDMENT. A modification to the SWPPP. CGP Part 5.0.

SWPPP MANAGER. The Contractor's Qualified Person with authority and responsibility. CGP Appendix C.

SWPPP PREPARER. The Contractor's Qualified Person with authority and responsibility. CGP Appendix C.

TEMPORARY STABILIZATION. See CGP Appendix C. See "Stabilization."

641-1.2.1 REFERENCE. A complete list of websites and documents referenced herein can be found at the DOT&PF Statewide Design and Engineering Services Stormwater webpage.

DEC Permit information can be found at the DEC Division of Water webpage. SWPPP preparation documents can be found at the DOT&PF Design and Engineering Services Stormwater webpage. Construction forms are found at the DOT&PF Design and Engineering Services Construction Forms webpage.

641-1.3 PLAN AND PERMIT SUBMITTALS.

For plans listed in Subsection 80-03.d (SWPPP, HMCP, and SPCC), use the Contractor submission and Department review deadlines identified in this Subsection.

Partial and incomplete submittals will not be accepted for review. Any submittal that is re-submitted or revised after submission, but before the review is completed, will restart the submittal review timeline. No additional Contract time or additional compensation will be allowed due to delays caused by partial or incomplete submittals, or required re-submittals.

- a. Storm Water Pollution Prevention Plan.** Submit an electronic copy and one hard copy of the SWPPP to the Engineer for approval. Deliver these documents to the Engineer at least 21 days before beginning Construction Activity. Organize the SWPPP and related documents for submittal according to the requirements of Subsection 641-2.1.b

The Department will review the SWPPP submittals within 14 days after they are received. Submittals will be returned to the Contractor, and marked as either "rejected" with reasons listed or as "approved" by the Department. When the submittal is rejected, the Contractor must revise and resubmit the SWPPP. The 14 day review period will restart when the contractor submits an electronic copy and one hard copy of the revised SWPPP to the Engineer for approval.

After the SWPPP is approved and certified by the Department using Form 25D-109, the Contractor must certify the approved SWPPP using Form 25D-111. See Subsection 641-1.3.d for further SWPPP submittal requirements.

- b. Hazardous Material Control Plan.** The HMCP Template can be found at the DOT&PF Construction Forms webpage. The HMCP submittal and review timeline, and signature requirements are the same as the SWPPP.
- c. Spill Prevention, Control and Countermeasure Plan.** When a SPCC Plan is required under Subsection 641-2.3, submit an electronic copy and one hard copy of the SPCC Plan to the Engineer. Deliver these documents to the Engineer at least 21 days before beginning Construction Activity. The Department reserves the right to review the SPCC Plan and require modifications.
- d. CGP Coverage.** The Contractor is responsible for permitting of Contractor and subcontractor Construction Activities related to the Project. Do not use the SWPPP for Construction Activities outside the Project Zone where the Department is not an operator. For Construction Activities outside the Project Zone, the Contractor must use a SWPPP2. Department approval is not needed for a SWPPP2.

After the Department certifies the SWPPP and prior to beginning Construction Activity, submit an eNOI with the required fee to DEC for coverage under the CGP. Submit a copy of the signed eNOI and DEC's written acknowledgement (by letter or other document), to the Engineer as soon as practicable and no later than three days after filing eNOI or receiving a written response.

Do not begin Construction Activity until the conditions listed in Subsection 641-3.1.a are completed.

The Department will submit an eNOI to DEC for Construction Activities inside the Project Zone. The Engineer will provide the Contractor with a copy of the Department's eNOI and DEC's written acknowledgment (by letter or other document), for inclusion in the SWPPP.

Before Construction Activities occur, transmit to the Engineer one hard copy and an electronic copy of the approved and certified SWPPP, with signed Delegations of Signature Authorities on Forms 25D-107 and 25D-108, SWPPP Certifications on Forms 25D-111 and 25D-109, both permittee's signed eNOIs and DEC's written acknowledgement.

- e. DEC SWPPP Review.** When CGP Part 2.1.3 or 2.1.4, requires DEC SWPPP review:
 - (1) Transmit a copy of the Department-approved SWPPP to DEC using delivery receipt confirmation;
 - (2) Transmit a copy of the delivery receipt confirmation to the Engineer within seven (7) days of receiving the confirmation; and
 - (3) Retain a copy of delivery receipt confirmation in the SWPPP.
- f. Local Government SWPPP Review.** When local government or the CGP Part 2.1.4, requires local government review:
 - (1) Transmit a copy of the Department-approved SWPPP and other information as required to local government, with the required fee. Use delivery receipt confirmation;
 - (2) Transmit a copy of the delivery receipt confirmation to the Engineer within seven days of receiving the confirmation;
 - (3) Transmit a copy of any comments by the local government to the Engineer within seven days of receipt;
 - (4) Amend the SWPPP as necessary to address local government comments and transmit SWPPP Amendments to the Engineer within seven days of receipt of the comments;

(5) Include a copy of local government SWPPP review letter in the SWPPP; and

(6) File a notification with local government that the project is ending.

g. Modifying Contractor’s eNOI. When required by the CGP Part 2.7, modify your eNOI to update or correct information within 30 calendar days of the change. Reasons for modification are found in the CGP Part 2.7.1. The Contractor must submit an eNOT instead of an eNOI modification when the operator has changed. The new operator must file an eNOI to obtain permit coverage.

641-1.4 PERSONNEL QUALIFICATIONS. Provide documentation in the SWPPP that the individuals serving in these positions meet the personnel qualifications. The Department accepts the following certificates as equivalent to AK-CESCL: CPESC, Certified Professional in Erosion and Sediment Control or CISEC, Certified Inspector in Sediment and Erosion Control, which are found in the CGP Appendix C and repeated below.

**Table 641-1
Personnel Qualifications**

Personnel Title	Required Qualifications
SWPPP Preparer	Current certification as a Certified Professional in Erosion and Sediment Control (CPESC); OR Current certification as AK-CESCL, and at least two years’ experience in erosion and sediment control, as a SWPPP Manager or SWPPP writer, or equivalent. OR Professional Engineer registered in the State of Alaska with current certification as AK-CESCL.
Superintendent	Current AK-CESCL or substitute training from CGP Appendix C Qualified Person Table 4
SWPPP Manager	Current AK-CESCL or substitute training from CGP Appendix C Qualified Person Table 4
Active Treatment System Operator	Current AK-CESCL or substitute training from CGP Appendix C Qualified Person Table 4. ATS operator should possess a recognized certification, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to meet the ATS requirement.

641-1.5 SIGNATURE/CERTIFICATION REQUIREMENTS AND DELEGATIONS.

a. eNOI and eNOT. The eNOI, eNOT, and eNOI Modifications must be signed and certified by a responsible corporate officer according to CGP Appendix A, Part 1.12. Signature and certification authority for the eNOI and eNOT cannot be delegated.

b. Delegation of Signature Authority for Other SWPPP Documents and Reports. Use Form 25D-108 to delegate signature authority and certification authority to the Superintendent position, according to CGP Appendix A, Part 1.12.3, for the SWPPP, inspection reports and other reports required by the CGP. The Superintendent position is responsible for signing and certifying the SWPPP, inspection reports, and other reports required by the CGP, except the eNOI, eNOI Modifications, and eNOT.

The Engineer will provide the Department’s delegation on Form 25D-107, which the Contractor must include in the SWPPP.

- c. **Subcontractor Certification.** Subcontractors must certify on Form 25D-105, that they have read and will abide by the CGP and the conditions of the project SWPPP.
- d. **Signatures and Initials.** Certify or initial on the CGP documents and SWPPP forms, wherever a signature or initial is required.

641-1.6 RESPONSIBILITY FOR STORM WATER PERMIT COVERAGE.

- a. The Department and the Contractor are jointly responsible for permitting and permit compliance within the Project Zone.
- b. The Contractor is responsible for permitting and permit compliance for all construction support activity in the Project Zone and outside the Project Zone. The Contractor has sole responsibility for compliance with DEC, COE and other applicable federal, state, and local requirements, and for securing all necessary clearances, rights, and permits. The Contractor shall be responsible for protection, care, and upkeep of all work, and all associated off-site zones. Subsection 70-02 describes the requirement to obtain permits, and to provide permit documents to the Engineer.
- c. The Contractor is responsible for obtaining an Excavation Dewatering Permit (AKG002000) if construction activities are within 1,500 feet of a DEC-identified contaminated site or groundwater plume.
- d. An entity that owns or operates, a commercial plant as defined in Subsection 80-01.d. or material source or disposal site outside the Project Zone, is responsible for permitting and permit compliance. The Contractor has sole responsibility to verify that the entity has appropriate permit coverage. Subsection 70-02 describes the requirement to obtain permits, and to provide permit documents to the Engineer.
- e. The Department is not responsible for permitting or permit compliance, and is not liable for fines resulting from noncompliance with permit conditions:
 - (1) For areas outside the Project Zone;
 - (2) For Construction Activity and Support Activities outside the Project Zone; and
 - (3) For commercial plants, commercial material sources, and commercial disposal sites.

641-1.7 UTILITY. (RESERVED FOR REGIONS)

641-2.1 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS.

a. SWPPP Preparer and Pre-Construction Site Visit.

Use a SWPPP Preparer to develop the SWPPP in accordance with the CGP, DEC and Department SWPPP templates. See Subsection P-641-1.2.1 for guidance and templates. The SWPPP Preparer must conduct a pre-construction inspection at the Project Site before Construction Activity begins. If the SWPPP Preparer is not a Contractor employee, the SWPPP Preparer must visit the site accompanied by the Contractor. Give the Department at least seven days advance notice of the site visit, so that the Department may participate.

Document the SWPPP Preparer's pre-construction inspection in the SWPPP on Form 25D-106, SWPPP Pre-Construction Site Visit, including the names of attendees and the date.

b. Developing the SWPPP.

Use the Department's ESCP, Environmental commitments, and other Contract documents as a starting point for developing the SWPPP.

Develop the SWPPP with sections and appendices, according to the DEC CGP SWPPP template and DOT&PF SWPPP template. Include information required by the Contract and described in the CGP Part 5.0. Use SWPPP forms found at the DOT&PF Construction Forms website.

Compile the SWPPP in three ring binders with tabbed and labeled dividers for each appendix. One electronic copy of the SWPPP must be submitted as a single PDF file.

c. SWPPP Considerations and Contents.

- (1) The SWPPP must provide erosion and sediment control measures for all Construction Activity within the Project Zone. Construction Activity outside the Project Zone must have permit coverage and document permit compliance according to a SWPPP2.
- (2) The SWPPP must consider the activities of the Contractor and all subcontractors and utility companies performing work in the Project Zone. The SWPPP must describe the roles and responsibilities of the Contractor, subcontractors, utility companies, and the Department with regard to implementation of the SWPPP. The SWPPP must identify all operators for the project, including utility companies performing Construction Activity, and identify the areas:
 - (a) Over which each operator has operational control, and;
 - (b) Where the Department and Contractor are co-operators.
- (3) For work outside the Project Zone the SWPPP must identify the entity that has stormwater permit coverage, the operator, and the areas that are:
 - (a) Dedicated to the project and where the Department is not an operator; and
 - (b) Not dedicated to the project, but used for the project.
- (4) The SWPPP must meet all CGP requirements. Utilize the DEC CGP SWPPP Template in conjunction with the DOT&PF SWPPP Template to develop the SWPPP.
- (5) Comply with the CGP Part 1.4.3 Authorized Non-Storm Water Discharges.
- (6) If the project discharges to a Tier III, Outstanding Natural Resource Water, comply with CGP Part 2.1.6. Submittal deadlines apply prior to filing an eNOI and beginning construction activities. As noted, none have been designated in the state of Alaska as of the issuance of the 2021 CGP.
- (7) There are special requirements in the CGP Part 3.2, for stormwater discharges into an impaired water body, and they may include monitoring of stormwater discharges. The Contractor is responsible for monitoring and reporting outside the Project Zone.
- (8) Describe the sequence and timing of activities that disturb soils and BMP implementation and removal. Phase earth disturbing activities to minimize unstabilized areas, and to achieve temporary or final stabilization. Whenever practicable incorporate final stabilization work into excavation, embankment and grading activities. Include drawings showing each phase of the project with the BMPs implemented in the phase.
- (9) Delineate the site according to CGP Part 4.2.1.
- (10) Minimize the amount of soil exposed and preserve natural topsoil on site, unless infeasible according to the CGP Part 4.2.2.
- (11) Describe methods and time limits, to initiate temporary or final soil stabilization. Comply with stabilization requirements in the CGP Part 4.5.

- (12) If construction will cease during winter months, describe all requirements for winter shutdown according to the CGP Part 4.12.
- (13) Plans for ATS must meet with the requirements in the CGP Part 2.1.5 and 4.6.
- (14) Design all temporary BMPs to accommodate a two year 24-hour storm event. All installed control measures must be described and documented in the SWPPP, according to the CGP Part 5.3.6. All installed BMPs must include a citation from a published BMP Manual, publication, or manufacturers specification used as a source, or include a statement "No BMP Manual was used for this design." If using out of state BMPs follow the instructions in the SWPPP Guide, found at the DOT&PF Stormwater webpage.
- (15) Provide a legible site map or set of maps in the SWPPP, showing the entire site and identifying boundaries of the property where construction and earth-disturbing activities will occur. Include all the elements described in the CGP Part 5.3.5, and DEC CGP SWPPP Template Section 5.0.
- (16) Identify the inspection frequency in the SWPPP according to the CGP Part 6.1.
- (17) Linear Project Inspections, described in CGP Part 6.5, are not applicable to this contract.
- (18) The SWPPP must cite and incorporate applicable requirements of the project permits, environmental commitments, COE permit, and commitments related to historic preservation. Make additional consultations or obtain permits as necessary for Contractor specific activities that were not included in the Department's permitting and consultation.
- (19) The SWPPP is a dynamic document. Keep the SWPPP current by noting installation, modification, and removal of BMPs, and by using amendments, SWPPP amendment logs, inspection reports, corrective action logs, records of land disturbance and stabilization, and any other records necessary to document stormwater pollution prevention activities and to satisfy the requirements of the CGP and this specification. See Subsection 641-3.3 for more information.

d. Recording Personnel and Contact Information in the SWPPP.

Identify the SWPPP Manager as the Storm Water Lead and Stormwater Inspector positions in the SWPPP. Document the SWPPP Manager's responsibilities in Section 2.0 Stormwater Contacts, of the SWPPP template and:

- (1) Identify that the SWPPP Manager does not have authority to sign inspection reports (unless the SWPPP Manager is also the designated project Superintendent).
- (2) Identify that the SWPPP Manager cannot prepare the SWPPP unless the SWPPP Manager meets the Contract requirements for the SWPPP Preparer.

Include in the SWPPP proof of AK-CESCL or equivalent certifications for the Superintendent and SWPPP Manager, and for any acting Superintendent and acting SWPPP Managers. If the Superintendent or SWPPP Manager is replaced permanently or temporarily, by an acting Superintendent or acting SWPPP Manager; record in the SWPPP (use Form 25D-127) the names of the replacement personnel and date of replacement. For temporary personnel, record their beginning and ending dates.

Provide 24-hour contact information for the Superintendent and SWPPP Manager. The Superintendent and SWPPP Manager must have 24-hour contact information for all Subcontractor SWPPP Coordinators and Utility SWPPP Coordinators.

Include in the SWPPP proof of AK-CESCL or equivalent certifications of ATS operators. Record names of ATS operators and their beginning and ending dates, on Form 25D-127.

The Department will provide proof of AK-CESCL, or equivalent certifications for the Department's Project Engineer, Stormwater Inspectors, and Monitoring Person (if applicable), and names and dates they are acting in that position. Include the Department's staff certifications in Appendix E. Include Department's staff names, dates acting, and assignments in Section 2.0 of the SWPPP and Form 25D-127.

641-2.2 HAZARDOUS MATERIAL CONTROL PLAN (HMCP) REQUIREMENTS.

Prepare the HMCP using the Department template for the prevention of pollution from storage, use, containment, cleanup, and disposal of all hazardous material, including petroleum products related to construction activities and equipment. Include the HMCP as an appendix to the SWPPP. Compile Material Safety Data Sheets in one location and reference that location in the HMCP.

641-2.3 SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN (SPCC PLAN) REQUIREMENTS.

Prepare and implement an SPCC Plan when required by 40 CFR 112 when both of the following conditions are present on the project:

- a. Oil or petroleum products from a spill may reach navigable waters (as defined in 40 CFR 112); and
- b. Total above ground storage capacity for oil and any petroleum products is greater than 1,320 gallons (not including onboard tanks for fuel or hydraulic fluid used primarily to power the movement of a motor vehicle or ancillary onboard oil-filled operational equipment, and not including containers with a storage capacity of less than 55 gallons).

Reference the SPCC Plan in the HMCP and SWPPP.

641-2.4 RESPONSIBILITY AND AUTHORITY OF THE SUPERINTENDENT AND SWPPP MANAGER.

The Superintendent shall certify the SWPPP, inspection reports, and other reports required by the CGP, except the eNOI and eNOT. The Superintendent may not delegate the task or responsibility of signing and certifying these documents.

The Superintendent may assign certain duties to the SWPPP Manager.

- a. Ensuring Contractor's and subcontractor's compliance with the SWPPP and CGP;
- b. Ensuring the control of erosion, sedimentation, or discharge of pollutants;
- c. Directing and overseeing installation, maintenance, and removal of BMPs;
- d. Performing inspections; and
- e. Updating the SWPPP including adding amendments and forms.

When Bid Item P641.070.0000 is part of the Contract, the SWPPP Manager must be a different person than the Superintendent and must be available at all times to administer SWPPP requirements, and be physically present within the Project Zone or the project office, when construction activities are occurring.

The Superintendent and SWPPP Manager shall be knowledgeable in the requirements of this Item P-641, the SWPPP, CGP, BMPs, HMCP, SPCC Plan, environmental permits, environmental commitments.

The Superintendent and SWPPP Manager shall have the Contractor's complete authority and be responsible for suspending construction activities that do not conform to the SWPPP or CGP.

641-2.5 MATERIALS.

Use materials suitable to withstand hydraulic, wind, and soil forces, and to control erosion and trap sediments according to the requirements of the CGP and the Specifications.

Use the seed mixture specified in the contract or as directed by the Engineer.

Use soil stabilization material as specified in P-682 and T-908.

Use silt fences as specified in P-680.

Use straw and straw products certified weed free of prohibited and restricted noxious weed seed and quarantined pests, according to Alaska Administrative Code, Title 11, Chapter 34 (11 AAC 34). When straw or straw products certified according to 11 AAC 34 are not available, use non-certified products manufactured within Alaska before certified products manufactured in another state, country, or territory. Non-certified straw or straw products manufactured in another state, country, or territory shall not be used. Grass, legumes, or any other herbaceous plants produced as hay, shall not be substituted for straw or straw products.

641-3.1 CONSTRUCTION REQUIREMENTS.

Comply with the SWPPP and the requirements of the CGP Part 5.0.

a. Before Construction

The following actions must be completed before Construction Activity begins:

- (1) The SWPPP Preparer must visit the project, the visit must be documented in the SWPPP using Form 25D-106, and the SWPPP must be developed or amended with findings from the visit.
- (2) The SWPPP must be approved by the Engineer on Form 25D-109.
- (3) The Contractor must be authorized to begin work by the Engineer.
- (4) The Project must have an eNOI for the Department and for the Contractor.
- (5) The Department approved SWPPP must be submitted to DEC and Local Government per CGP Part 2.1.2, Part 2.1.4, and Part 2.4.1.
- (6) The Contractor has transmitted to the Engineer an electronic copy and at least one hardcopy of the approved SWPPP.
- (7) The Delegation of Authority forms 25D-108 and 25D-107 for both the Contractor and Engineer are signed.
- (8) Main entrance signage must meet requirements of CGP Part 5.10.2.

Post notices on the outside wall of the Contractor's project office, and near the main entrances of the construction project. Protect postings from the weather. Locate postings so the public can safely read them without obstructing construction activities or the traveling public (for example, at an existing pullout). Do not use retroreflective signs for the SWPPP posting. Do not locate SWPPP signs in locations where the signs may be confused with traffic control signs or devices. Update the notices if the listed information changes.

- (9) Track precipitation according to CGP Part 7.3.9. Submit the method to track precipitation to the Engineer for approval.

b. During Construction

- (1) Delineate the site according to the CGP Part 4.2.1.

- (2) Install required BMPs according to the SWPPP prior to the initiation of ground disturbance.
- (3) Document subcontractors. Provide a copy of the SWPPP and the CGP to all subcontractors and utility companies before they begin soil disturbing activities, and verify they understand and comply with the SWPPP and CGP and:
 - (a) Document all subcontractors and utility companies that may work on the site, according to the CGP Part 5.3.1, and SWPPP Section 1.2.
 - (b) Require subcontractors and utility companies to sign the SWPPP Subcontractor Certification (Form 25D-105). Include in the signed Form in the SWPPP Appendix E.
 - (c) Inform subcontractors and utility companies in a timely manner of SWPPP amendments that affect them. Coordinate with subcontractors and utility companies to protect BMPs, including temporary and final stabilization from damage.
 - (d) Notify the Engineer immediately if the actions of any utility company or subcontractor do not comply with the SWPPP and the CGP.
- (4) Provide ongoing training to all employees, subcontractors and utility companies, in accordance with the CGP Part 4.14. Training must:
 - (a) Be given no less than once a month during construction activity;
 - (b) Be documented in the SWPPP Training Log using Form 25D-125. Include the training record in the SWPPP Appendix I.
- (5) Protection and Restoration. Comply with Subsection 70-11.
- (6) Good housekeeping measures to comply with the SWPPP and CGP 4.8.
- (7) Control measures. Comply with the SWPPP and CGP Part 5.3.6 including:
 - (a) Maintain BMPs.
 - (b) Comply with requirements of the HMCP and SPCC Plan, if applicable and all local, state and federal regulations that pertain to the handling, storage, containment, cleanup, and disposal of petroleum products or other hazardous materials.
 - (c) Keep the SWPPP and HMCP current (refer to Subsection 641-2.1.c, SWPPP Considerations and Contents).

c. Winter Construction

If winter construction activity occurs, the project must have appropriate BMPs in place CGP Part 4.12.2. Inspections can be reduced to once per month if the project meets the requirements in the CGP Part 6.2.4.

d. Storm Water Discharge Pollutant Reporting Requirements

If an incident of non-compliance occurs that may endanger health or the environment a report must be made, CGP, Appendix A, Part 3.4.

A permit non-compliance is considered any type of pollutant, such as turbidity or petroleum that enters storm water runoff and flows into a receiving water body, MS4, or wetland that is connected to waters of the U.S.

- (1) Immediately report the incident to the Engineer verbally;

- (2) Report to DEC verbally within 24 hours after the permittee becomes aware of the incident, and;
- (3) Report to DEC in writing within five days after the permittee becomes aware of the circumstances. To report in writing, complete the written noncompliance report on Form 25D-143, and file the written report with DEC. Coordinate the report with the Engineer. Include in the report:
 - (a) A description of the noncompliance and its causes;
 - (b) The exact dates and times of noncompliance;
 - (c) If not yet corrected the anticipated time the project will be brought back into compliance, and;
 - (d) The corrective action taken or planned to reduce, eliminate and prevent reoccurrence.
- (4) Notify the Engineer immediately if there is incident of noncompliance with COE Permits. The Engineer will notify the COE.

e. Hazardous Materials Reporting Requirements

Any release of a hazardous substance must be reported immediately to the Engineer as soon as the person has knowledge of the discharge.

Report spills of petroleum products or other hazardous materials to the Engineer and other agencies as required by law, and according to CGP Part 9.3.

- (1) To water; any amount released must be reported immediately to the Engineer, DEC, and the Coast Guard.
- (2) To land:
 - (a) Any release of a petroleum product in excess of 55 gallons must be reported as soon as the person has knowledge of the discharge CGP Part 9.3.2.
 - (b) Any release of a petroleum product in excess of 10 gallons but less than 55 gallons must be reported to the Engineer and must be reported to DEC within 48 hours after the person has knowledge of the discharge CGP Part 9.3.2.
 - (c) Any release of a petroleum product in excess of 1 gallon to 10 gallons must be recorded and logged and provided to DEC on a monthly basis.
- (3) Use the HMCP and SPCC Plan (if available) for contact information to report spills to regulatory agencies.
- (4) Implement measures to prevent the reoccurrence of and to respond to such releases.
- (5) Prior to disposal of contaminated material, submit a Contaminated Media Transport and Treatment Disposal Approval Form to DEC Spill Prevention and Response. Dispose as approved by DEC.

f. Corrective Action and Maintenance of BMPs

Implement maintenance as required by the CGP Part 4.13 and Part 8.0, SWPPP, and manufacturer's specifications, whichever is more restrictive.

- (1) Implement corrective action to comply with the CGP Part 8.0 and the SWPPP.
- (2) Corrective action deadlines and documentation:
 - (a) Corrective actions must be completed according to CGP Part 8.2.

- (b) Document corrective actions in the Corrective Action Log (25D-112) according to the SWPPP, CGP Part 8.3 and Part 5.9.2.

If a different BMP is installed to correct the condition leading to the corrective action a SWPPP Amendment must be completed.

- (c) If a corrective action is not completed according to the CGP 8.2, document the conditions in the Corrective Action Log, notify the Engineer, and implement the corrective action as soon as possible.

The Engineer may assign a new complete-by date using a Delayed Action Item Report, Form 25D-113 (DAIR Form), if the contractor is unable to complete the corrective action within the required timeframe. The DAIR Form can only be authorized and completed by the Engineer.

g. Stabilization

- (1) All Soil Stabilization requirements must be met in accordance with CGP Part 4.5 and the SWPPP.
- (2) When temporary or permanent seeding is required, provide a working hydro seeding equipment located within 100 miles of the project by road; with 1,000 gallon or more tank capacity, paddle agitation of tank, and the capability to reach the seed areas with a uniform mixture of water, seed, mulch and tackifier. If the project is located in an isolated community, the hydro-seeder must be located at the project.
- (3) Apply temporary seed and stabilization measures after preparing the surface to reduce erosion potential and to facilitate germination and growth of vegetative cover according to T-901.
- (4) Apply permanent seed and stabilization measures after land-disturbing activity has permanently ceased. Comply with the CGP, SWPPP, and items T-907, T-908 or T-920 as specified.
- (5) Incorporate final or temporary stabilization immediately after installing culverts or drainage structures to satisfy CGP Part 4.5, the SWPPP and the Engineer. Stabilize under any bridges, and in areas upstream and downstream of culverts, drainages and areas disturbed by related construction activities after installation, or before deactivating stream bypass or diversion.
- (6) Stabilization before Fall Freeze up and Spring Thaw.

Stabilize Construction Activities within the Project Zone with appropriate BMPs prior to the anticipated date of fall freeze up, in accordance with the SWPPP and CGP, Part 4.12.

Exceptions to stabilization prior to anticipated date of fall freeze up include:

- (a) Where temporary stabilization activities are precluded by snow cover or frozen ground conditions prior to the anticipated date of fall freeze up, stabilization measures must be initiated as soon as practicable following the actual spring thaw.
- (b) When winter construction activity is authorized by the Engineer and conducted according to the contract.

h. Ending CGP Coverage

- (1) The Engineer will determine the date that all the following conditions for ending CGP coverage have been met within the Project Zone:
 - (a) Land disturbing activities have ceased;

- (b) Final Stabilization has been achieved on all portions of the Project Zone, according to the CGP 4.5.2 (including at Department furnished material sources, disposal sites, staging areas, equipment areas, etc.), and;
 - (c) Temporary BMPs have been removed.
- (2) After the Engineer has determined the conditions have been met for submitting an NOT in accordance to CGP Part 10.2, the Department will:
- (a) Send written notice to the Contractor with the date that the conditions were met;
 - (b) Submit an eNOT to DEC within 30 days, and;
 - (c) Provide a copy of the eNOT and DEC's acknowledgement letter to the Contractor.
- (3) If the Contractor's CGP eNOI acreage includes Support Activities and any other areas where the Department is not an Operator, the Contractor may not be able to file an eNOT at the same time as the Department.
- (4) The Contractor must submit a copy of each signed eNOT and DEC's acknowledgement letter to the Department within three days of filing the eNOT or receiving a written response. Insert the eNOT and DEC acknowledgement letter in SWPPP Appendix Q.
- (5) The Contractor is responsible for coordinating local government inspections of work and ending permit coverage with local government. See Subsection 641-1.3.e for more information.

i. Ending BMP Maintenance in the Project Zone

The Contractor is responsible for continuing inspections, BMP maintenance and SWPPP updates until permit coverage is ended.

j. Transmit final SWPPP

Transmit one electronic copy of the final SWPPP, including all SWPPP documents, to the Engineer, when the Contractor's eNOT is filed, or within 30 days of the Department's eNOT being filed, whichever is sooner.

641-3.2 SWPPP DOCUMENTS, LOCATION ON-SITE, AVAILABILITY, AND RECORD RETENTION.

The SWPPP and related documents maintained by the Contractor are the record for demonstrating compliance with the CGP. Copies of SWPPP documents transmitted to the Engineer under the requirements of this specification are informational and do not relieve the Contractor's responsibility to maintain complete records as required by the CGP and this specification.

Keep the SWPPP, HMCP and SPCC Plan if applicable at the on-site project office. If there is not an on-site project office, keep the documents at a locally available location that meets CGP requirements and is approved by the Engineer. Records may be moved to another office for record retention after the eNOTs are filed. Records may be moved to another office during winter shutdown. Update on-site postings if records are relocated during winter shutdown. Provide the Department with copies of all records.

Retain records and a copy of the SWPPP, for at least three years after the date of eNOT according to the CGP Part 9.4.

The SWPPP and related documents must be made available for review and copy, to the Department and other regulatory agencies that request them. See CGP Parts 5.10, 6.6 and 9.5.

641-3.3 SWPPP INSPECTIONS, AMENDMENTS, REPORTS, AND LOGS.

Perform inspections, prepare Inspection Reports, and prepare SWPPP Amendments in compliance with the SWPPP and the CGP using Department forms found at the DOT&PF Construction Forms website.

a. Inspection during Construction

Conduct Inspections according to the schedule and requirements of the SWPPP and CGP Part 6.0. When the project is on a 14 calendar day inspection frequency, conduct Post-Storm Event Inspections within 24 hours of the end of a storm event, as required, in addition to the 14 day predetermined inspection cycle.

Inspections required by the CGP and SWPPP must be performed by the Contractor's SWPPP Manager and the Department's Stormwater Inspector jointly, unless approved by the Engineer, when:

- (1) One of the inspectors is not on site, access is only by air, and weather delayed or canceled flights;
- (2) One of the inspectors is sick;
- (3) The project is on a reduced frequency inspection schedule with no staff on site, the only access to the site is by air, and it is economical to send only one inspector, or;
- (4) When the Engineer determines a safety concern that makes joint inspection impracticable.

When this is the case, the Operator who conducts the inspection must provide a copy of the Inspection Report to the other Operator within three days of the inspection date and document the date of the report transmittal in SWPPP Appendix K.

b. Inspection Reports

Use only the Department SWPPP Construction Site Inspection Report, Form 25D-100, to record inspections. Changes or revisions to Form 25D-100 are not permitted, except for adding or deleting data fields that list Location of Discharge Points and Site Specific BMPs. Complete all fields in the Inspection Report; do not leave any fields blank.

Refer to the DOT&PF Construction Forms webpage for instruction to complete Form 25D-100.

The Superintendent or SWPPP Manager must review and correct all errors within three days of the date of inspection.

Inspection Reports must be signed by the person described in the CGP Appendix A, Part 1.12 or by a duly authorized representative of that person. Only the Superintendent can certify the Inspection Form.

Insert a Complete-by-Date for each corrective action listed that complies CGP Part 8.2.

Provide a copy of the completed, unsigned Inspection Report to the Engineer by the end of the next business day following the inspection.

The Engineer may coordinate with the Superintendent to review and correct any errors or omissions before the Superintendent signs the report. Corrections are limited to adding missing information or correcting entries to match field notes and conditions present at the time the inspection was performed. The signed and certified Inspection Report must be provided to the Engineer on the same day the Superintendent signed the form.

The Engineer will sign and certify the Inspection Report and will return the original to the Contractor within three working days if compliant with the CGP and SWPPP.

If the Inspection Report is not compliant with the CGP or SWPPP the Engineer may make corrections after the Superintendent has signed and certified the Inspection Report. The Engineer will initial and date each correction. If the Engineer makes corrections, the Superintendent must recertify the

Inspection Report by entering a new signature and date in the white space below the original signature and date lines. Send a copy of the recertified Inspection Report to the Engineer on the day it is recertified.

When a correction is required to an Inspection Report that was already certified by both the Superintendent and Engineer, follow directions given below:

If subsequent corrections are required for a certified Inspection Report 25D-100, document the corrections in an addendum memo that addresses only the omitted or erroneous portions of the original Inspection Report. The Superintendent and the Engineer must both sign and certify the updated Inspection Report and addendum memo. File the corresponding Inspection Report and memo in the SWPPP Appendix K and update the amendment log. The issuance of an addendum memo does not relieve the Contractor of liquidated damages that may have been incurred as a result of the error on the original certified inspection report.

c. Items and Areas to Inspect

Conduct inspections of all areas required by the CGP Part 6.4 and SWPPP.

d. Reduced Inspection Frequencies

Conduct inspections according to the inspection schedule indicated in the approved SWPPP. Any change in inspection frequency must be approved by the Engineer, and beginning and ending dates documented as an amendment to the SWPPP.

If the Engineer approves and the entire site is stabilized, the frequency of inspections may be reduced in accordance to the CGP Part 6.2.1. At actively staffed sites, inspect within two business days of the end of a storm event that results in a discharge from the site.

e. Winter Shutdown Inspection

Conduct winter shutdown inspection 14 calendar days after the anticipated fall freeze up date and conditions under the CGP Parts 4.12, 6.2.3, and the SWPPP are met. The Engineer may approve suspension of inspections and waive requirements for updating the Grading and Stabilization Activities Log and Daily Record of Rainfall Form during Winter Shutdown.

Inspections must resume on a regular frequency or reduced inspection frequency identified in the SWPPP, at least 21 days before anticipated spring thaw CGP Part 6.2.3. Resume updating the Daily Record of Rainfall Form at the start of the 21-day spring thaw inspection.

f. Inspection before Project Completion.

Conduct inspection to ensure Final Stabilization is complete throughout the Project, and temporary BMPs that are required to be removed are removed. Temporary BMPs that are biodegradable and are specifically designed and installed with the intent of remaining in place until they degrade, may remain in place after project completion if approved by the Project Engineer.

g. SWPPP Amendments and SWPPP Amendment Log

The SWPPP Amendment Log Form 25D-114 must be filled out by an individual who holds a current AK-CESCL, or equivalent certification. The Superintendent or the SWPPP Manager must sign and date amendments to the SWPPP and updates to the SWPPP Amendment Log.

SWPPP Amendments must be approved by the Engineer.

Amendments must occur:

- (1) Whenever there is a change in design, construction operation, or maintenance at the construction site that has or could cause erosion, sedimentation or the discharge of pollutants that has not been previously addressed in the SWPPP;
- (2) If an inspection identifies that any portion of the SWPPP is ineffective in preventing erosion, sedimentation, or the discharge of pollutants;
- (3) Whenever an inspection identifies a problem that requires additional or modified BMPs or a BMP not shown in the original SWPPP is added;
- (4) If the inspection frequency is modified (note beginning and ending dates);
- (5) When there is a change in personnel who are named in the SWPPP, according to Subsection 641-2.1.d.
- (6) When an inspection is not conducted jointly;
- (7) When a NOI modification is filed;
- (8) When a Noncompliance Report is filed with DEC.

Place all correspondence with DEC, EPA or MS4s in Appendix Q.

Amend the SWPPP as soon as practicable after any change or modification, but in no case later than seven days following identification of the need for an amendment. All SWPPP Amendments must have an amendment number, be dated, and signed.

Keep the SWPPP Amendment Log current. Prior to a scheduled inspection or submittal of an inspection, submit to the Engineer a copy of the pages of the Amendment Log that contain new entries since the last submittal. Include copies of any documents amending the SWPPP.

Keep the SWPPP Amendment Log in Appendix M.

h. Site Maps

Maintain site maps in accordance with CGP Part 5.3.5 and the SWPPP template 5.0. It is acceptable to have separate site maps for BMPs and grading and stabilization activities.

i. Corrective Action Log

The Superintendent and SWPPP Manager are the only persons authorized to make entries on the SWPPP Corrective Action Log, Form 25D-112.

The Corrective Action Log must document corrective actions required by the conditions listed in the CGP Part 8.0. Document the need for corrective action within 24 hours of either:

- (1) Identification during an inspection, or;
- (2) Discovery by the Department's or Contractor's staff, a subcontractor, or a regulatory agency inspector;
- (3) If a corrective action is discovered outside of an inspection, update the log with the date of discovery, the proposed corrective action, and the date the corrective action was completed.

Keep the Corrective Action Log current and submit a copy to the Engineer prior to performing each scheduled SWPPP Inspection.

Keep the Corrective Action Log in Appendix J of the SWPPP.

j. Grading and Stabilization Activities Log

The Superintendent and SWPPP Manager are the only persons authorized to date and initial entries on the SWPPP Grading and Stabilization Activities Log, Form 25D-110. Use the SWPPP Grading and Stabilization Activities Log, to record land disturbance and stabilization activities.

Keep the Grading and Stabilization Activities Log current and submit a copy to the Engineer prior to performing each scheduled SWPPP Inspection. Keep the Grading and Stabilization Activities Log organized and completed to demonstrate compliance with the CGP Part 4.5.

Keep the Grading and Stabilization Activities Log in Appendix G of the SWPPP.

k. Daily Record of Rainfall

Use SWPPP Daily Record of Rainfall, Form 25D-115 to comply with CGP Part 7.3.9. Submit a copy to the Engineer with each completed Inspection Report. Keep the Daily Record of Rainfall current in Appendix N of the SWPPP.

l. Staff Tracking Log

Use the SWPPP Project Staff Tracking Form 25D-127, to identify project staff that are required to be AK-CESCL certified or hold an equivalent qualification CGP Appendix C. Complete this form to document the following positions; Superintendent, SWPPP Manager, Engineer, DOT&PF Stormwater Inspector, and when positions have changed in personnel, either permanent or temporary. Update the SWPPP Project Staff Tracking Form within 24-hours of any changes in personnel, qualifications, or other staffing items related to administration of the CGP or Item P-641.

641-3.4 FAILURE TO PERFORM WORK.

The Engineer has authority to suspend work and withhold monies according to Subsections 50-01 and 80-06 for the reasons listed under Subsection 80-06 and for an incident of noncompliance with the CGP or SWPPP that may endanger health or the environment or for failure to perform work related to Item P-641.

a. An incident of noncompliance includes, but is not limited to, the Contractor's failure to:

- (1) Obtain appropriate permits before Construction Activities occur;
- (2) Perform SWPPP administration;
- (3) Perform timely inspections;
- (4) Update the SWPPP;
- (5) Transmit updated SWPPP, Inspection Reports, and other updated SWPPP forms to the Engineer;
- (6) Maintain effective BMPs to control erosion, sedimentation, and pollution in accordance with the SWPPP, the CGP, and applicable local, state, and federal requirements;
- (7) Perform duties according to the requirements of Item P-641;
- (8) Meet requirements of the CGP, SWPPP, or other permits, laws, and regulations related to erosion, sediment, or pollution control, or;
- (9) Any other requirements established or included in the contract.

b. No additional Contract time or additional compensation will be allowed due to delays caused by the Engineer's suspension of work.

641-3.5 ACCESS TO WORK.

The Project, including any related off-site areas or support activities, must be made available for inspection, or sampling and monitoring, by the Department and other regulatory agencies. See CGP Part 6.6.

METHOD OF MEASUREMENT

641-4.1 See Section 90 and as follows:

Items P641.010.0000, P641.030.0000, and P641.070.0000 are lump sum.

Items P641.020.0000, P641.040.0000, and P641.050.0000 will be measured on a contingent sum basis as specified by the Directive authorizing the work.

Item P641.060.0000 will be measured on a contingent sum basis with withholding determined by the Department.

TABLE 641-1 BMP VALUES – RESERVED

Liquidated Damages assessed according to Table 641-2 are not an adjustment to the Contract amount. These damages charges are related to Contract performance but are billed by the Department to the Contractor, independent of the Contract amount. An amount equal to the Liquidated Damages may be withheld for unsatisfactory performance, from payment due under the Contract, until the Contractor remits payment for billed Liquidated Damages.

**TABLE 641-2 - VERSION C
EROSION, SEDIMENT AND POLLUTION CONTROL – LIQUIDATED DAMAGES**

Code	Specification Section Number and Description	Deductible Amount in Dollars	Cumulative Deductible Amounts in Dollars
A	641-1.4 Failure to have a qualified (AK-CESCL or equivalent) SWPPP Manager	Calculated in Code B or F	
B	Failure to meet SWPPP requirements of: (1) 641-2.1a Name of SWPPP Preparer (2) Not Applicable (3) 641-3.3h Sign and Date SWPPP amendments by qualified person (4) 641-3.2 Records maintained at project and made available for review	\$750 per omission	
C	Not Applicable		
D	641-3.3.e Failure to stabilize a Project prior to fall freeze up.	\$5,000 per Project per year	
E	641-2.1a Failure to conduct pre-construction inspections before Construction Activities on all projects greater than 1 acre.	\$2,000 per Project	
F*	641-3.3. Failure to conduct and record CGP Inspections 641-3.3a Personnel conducting Inspections and Frequency 641-3.3b Inspection Reports, use Form 25D-100, completed with all required information	\$750 per Inspection	Additional \$750 for every additional 7 day period without completing the required inspection.
G	641-3.1d Corrective action, failure to timely accomplish BMP maintenance and/or repairs. In effect until BMP maintenance and/or repairs is completed.	\$500 per Project per day	

Code	Specification Section Number and Description	Deductible Amount in Dollars	Cumulative Deductible Amounts in Dollars
H	641-3.1c Failure to provide to the Engineer and DEC a timely oral noncompliance report of violations or for a deficient oral noncompliance report	\$750 for the first day the report is late or deficient	Additional \$750 for every 14 day period with- out the required information
I	641-3.1c Failure to provide to the Engineer and DEC a timely written noncompliance report, use Form 25D-143, of violations or for a deficient written noncompliance report	\$750 for the first day the report is late or deficient	Additional \$750 for every 14 day period without the required information
J	641-3.4 Failure to comply with the requirements of the CGP, approved SWPPP, and Item P-641, except as listed above	\$750 per occurrence for the first day of noncompliance	Additional \$750 for every day the deficiency remains uncorrected

Code F* Liquidated Damages according to Code F will not be billed for typographic errors and minor data entry errors, except the liquidated damages will be assessed for these errors when:

- (1) the Contractor has previously been notified and subsequent inspection reports repeat the same or similar error,
- (2) multiple inspection reports are submitted after the submission due date and the same or similar errors are repeated on multiple overdue reports,
- (3) an error in recording the inspector's AK-CESCL certification date results in an inspector performing the inspection during a period when their certification was lapsed or was otherwise invalid.

BASIS OF PAYMENT

641-5.1 See Subsection 641-3.4 Failure to Perform Work, for additional work and payment requirements.

Item P641.010.0000 Erosion, Sediment and Pollution Control Administration. At the Contract lump sum price for administration of all work under this Section. Includes, but is not limited to, SWPPP and HMCP and SPCC Plan preparation, agency fees for SWPPP reviews, SWPPP amendments, pre-construction inspections, inspections, monitoring, reporting, and recordkeeping or copying records related to the SWPPP and required by the CGP, and record retention.

Item P641.020.0000 Temporary Erosion, Sediment and Pollution Control. At the contingent sum prices specified for all labor, supervision, material, equipment, and incidentals to install, maintain, remove and dispose of approved temporary erosion, sedimentation, and pollution control BMPs required to implement the SWPPP and SPCC Plan.

Item P641.030.0000 Temporary Erosion, Sediment and Pollution Control. At the Contract lump sum price for all labor, supervision, material, equipment, and incidentals to install, maintain, remove and dispose of temporary erosion, sedimentation, and pollution control BMPs identified in the SWPPP and SPCC Plan.

Item P641.040.0000 Temporary Erosion, Sediment and Pollution Control Additives. At the contingent sum prices specified in the Directive to authorize the work, for all labor, supervision, materials, equipment, and incidentals for extra, additional, or unanticipated work, to install, maintain, remove and dispose of temporary erosion, sedimentation, and pollution control BMPs not covered by Item P641.030.0000. All additional Erosion, Sediment, and Pollution Control Administration necessary due to this item will not be paid for separately but will be subsidiary to other bid items.

Item P641.050.0000 Temporary Erosion, Sediment and Pollution Control by Directive. At the contingent sum prices specified in the Directive using time and materials to authorize the work, for all labor, supervision, materials, equipment, and incidentals to install, maintain, remove and dispose of temporary erosion, sedimentation, and pollution control BMPs. Prices for this item will be by time and materials according to Subsection 90-05, or by mutual agreement between the Engineer and Contractor. All

additional Erosion, Sediment, and Pollution Control Administration necessary due to this item will not be paid for separately but will be subsidiary to other bid items.

Item P641.060.0000 Withholding. The Engineer may withhold an amount equal to Liquidated Damages, assessed according to Item P-641, from payment due the Contractor. Liquidated Damages for violations of the Contract, CWA, CGP, are determined by the Engineer according to Table 641-2. The Engineer may withhold payment due the Contractors until the Contractor pays the Liquidated Damages to the Department.

The Department will not release performance bonds until Liquidated Damages assessed according to Item P-641 are paid to the Department, and all requirements according to Subsection 30-05 are satisfied.

Item P641.070.0000 SWPPP Manager. At the Contract lump sum price for a SWPPP Manager that conforms to this specification. When Item P641.070.0000 appears in the Bid Schedule, the SWPPP Manager must be a different person than the superintendent, and must be physically present during construction activity with duties and authority as described in Subsection 641-2.4. When Item P641.070.0000 does not appear in the Bid Schedule, the SWPPP Manager is subsidiary to Item P641.010.0000.

Subsidiary Items. Temporary erosion, sediment and pollution control measures that are required outside the Project Zone are subsidiary. Work required by the HMCP and SPCC Plan including hazardous material storage, containment, removal, cleanup and disposal, are subsidiary to Item P641.010.0000 Erosion, Sediment and Pollution Control Administration.

Work under other pay items. Work that is paid for directly or indirectly under other pay items will not be measured and paid for under Item P-641. This work includes but is not limited to:

- a. Dewatering;
- b. Shoring;
- c. Bailing;
- d. Permanent seeding;
- e. Installation and removal of temporary work pads;
- f. Temporary accesses;
- g. Temporary drainage pipes and structures;
- h. Diversion channels;
- i. Settling impoundment, and;
- j. Filtration.

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

Work at the Contractor's Expense. Temporary erosion, sediment and pollution control measures that are required due to carelessness, negligence, or failure to install temporary or permanent controls as scheduled or ordered by the Engineer, or for the Contractor's convenience, are at the Contractor's expense.

Payment will be made under:

Item P641.010.0000	Erosion, Sediment and Pollution Control Administration – per lump sum
Item P641.020.0000	Temporary Erosion, Sediment and Pollution Control – per contingent sum
Item P641.030.0000	Temporary Erosion, Sediment and Pollution Control – per lump sum
Item P641.040.0000	Temporary Erosion, Sediment and Pollution Control Additives – per contingent sum
Item P641.050.0000	Temporary Erosion, Sediment and Pollution Control by Directive – per contingent sum
Item P641.060.0000	Withholding – per contingent sum
Item P641.070.0000	SWPPP Manager – per lump sum