STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

STANDARD SPECIFICATIONS
FOR
AIRPORT CONSTRUCTION

Ouzinkie Airport Relocation Stage II
Project # 52637 / AIP # 3-02-0480-002-2011

(Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports, as modified, and approved by the Federal Aviation Administration for Airport Improvement Program contracts in Alaska)

NOTE: Special Provisions for each project are marked as changes to the text of the Standard Specifications. Deleted text is identified by strikethrough. Additions are underlined.

CONTENTS

Page Number

GENERAL PROVISIONS

Section 10. Definitions and Terms ..... GCP-10-1 to GCP-10-9
Section 20. Bidding Requirements and Conditions ..... GCP-20-1 to GCP-20-5
Section 30. Award and Execution of Contract ..... GCP-30-1 to GCP-30-5
Section 40. Scope of Work ..... GCP-40-1 to GCP-40-6
Section 50. Control of Work ..... GCP-50-1 to GCP-50-13
Section 60. Control of Materials ..... GCP-60-1 to GCP-60-10
Section 70. Legal Relations and Responsibility to Public ..... GCP-70-1 to GCP-70-9
Section 80. Prosecution and Progress ..... GCP-80-1 to GCP-80-16
Section 90. Measurement and Payment ..... GCP-90-1 to GCP-90-8
Section 100. Contractor Quality Control Program ..... GCP-100-1 to GCP-100-6
Section 110. Method of Estimating Percentage of Material Within Specification Limits (PWL) ..... GCP-110-1 to GCP-110-5

FENCING

Item F-162 Chain Link Fence ..... F-162-1 to F-162-3
Item F-170 Steel Bollard ..... F-170-1 to F-170-2

CONTRACTOR FURNISHED SERVICES

Item G-100 Mobilization and Demobilization G-100-1
Item G-115 Worker Meals and Lodging, or Per Diem G-115-1
Item G-120 Disadvantaged Business Enterprise (DBE) Program ..... G-120-1 to G-120-8
Item G-130 Services to be Furnished by the Contractor ..... G-130-1 to G-130-8
Item G-131 Engineering Transportation ..... G-131-1 to G-131-2
Item G-135 Construction Surveying and Monuments ..... G-135-1 to G-135-7
Item G-150 Equipment Rental ..... G-150-1 to G-150-2
Item G-200 Contractor Quality Control Program G-200-1
Item G-300 Critical Path Method (CPM) Scheduling ..... G-300-1 to G-300-2
Item G-700 Traffic Control for Airports G-700-1
Item G-710 Traffic Control for Roads, Streets, and Highways ..... G-710-1 to G-710-11

LIGHTING & ELECTRICAL

Item L-100 Runway and Taxiway Lighting ..... L-100-1 to L-100-8
Item L-101 Rotating Beacon ..... L-101-1 to L-101-5
Item L-107 Wind Cone ..... L-107-1 to L-107-4
Item L-108 Underground Cable ..... L-108-1 to L-108-8
Item L-109 Transformer Vault and Vault Equipment ..... L-109-1 to L-109-11
Item L-110 Underground Electrical Duct ..... L-110-1 to L-110-6

EARTHWORK

Item P-151 Clearing and Grubbing ..... P-151-1 to P-151-3
Item P-152 Excavation and Embankment ..... P-152-1 to P-152-8
Item P-154 Subbase Course ..... P-154-1 to P-154-3
Item P-157 Erosion, Sediment, and Pollution Control ..... P-157-1 to P-157-21

AGGREGATE BASE & SURFACE COURSES

Item P-208 Aggregate Surface Course..... P-208-1 to P-208-4

MISCELLANEOUS

Item P-660 Retroreflective Markers and Cones..... P-660-1 to P-660-2

STRUCTURES

Item S-142 Equipment Storage Building.....S-142-1
Item S-143 Fuel Tank..... .S-143-1 to S-143-2

TURFING

Item T-901 Seeding..... T-901-1 to T-901-3
Item T-908 Soil Stabilization..... T-908-1 to T-908-3

APPENDICES

Appendix A – Erosion and Sediment Control Plan
Appendix B – Construction Surveying Requirements
Appendix C – Materials Sampling and Testing Frequency
Appendix D – Safety Plan
Appendix E – Permits
Appendix F – Traffic Plan (NOT APPLICABLE)
Appendix G – Sign Plan (NOT APPLICABLE)
Appendix H – Mining Plan (NOT APPLICABLE)
Appendix I – Aviation Materials Certification List
Appendix J – FAA Technical Specifications for Approach Lighting Aids (NOT APPLICABLE)
Appendix K – Mandatory Post-Award Conference Notice and Agenda
Appendix L – Snow Removal Equipment Building Technical Specifications
Appendix M – Material Sales Agreement (NOT APPLICABLE)

SECTION 10

DEFINITIONS AND 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.

These Specifications incorporate by reference a number of publications including regulations, design and constructions standards, or recommendations published by outside sources. 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	*Alaska Administrative Code*
AASHTO	American Association of State Highway and Transportation Officials
AC	*FAA Advisory Circular*
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	*Alaska Statute*
ASDS	*Alaska Sign Design Specifications*
ASTM	American Society for Testing & Materials
ATM	Alaska Test Method (See *Alaska Test Methods Manual*)
CFR	Code of Federal Regulations
CSP	Construction Safety 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
FOP	Field Operating Procedure (See *Alaska Test Methods Manual*)
FSS	Flight Service Station
ICEA	Insulated Cable Engineers Association (formerly IPCEA)
MRP	*Mining and Reclamation Plan*
NEC	*National Electrical Code*
NEMA	National Electrical Manufacturers Association
NOTAMs	*Notices to Airmen*
SSAC	*DOT&PF Standard Specifications for Airport Construction*
SSPC	Society for Protective Coatings
SPCC	*Spill Prevention, Control, and Countermeasure (Plan)*
SWPPP	*Storm Water Pollution Prevention Plan*
TCP	*Traffic Control Plan*
UL	Underwriters Laboratory
WAQTC	Western Alliance for Quality in Transportation Construction (See *Alaska Test Methods Manual*)

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. This is also called verification sampling and testing when specifically used to validate the contractor's data.

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.

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, ~~runway safety area,~~ taxiway, ~~taxiway safety area and~~ 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 TEST METHODS MANUAL. 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.

APPENDICES. Supplemental contract documents.

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

BUILDING BOUNDARY LINE. A line located five feet horizontal distance outside the exterior edge of the foundation of any building included in the work. Work within the building boundary line and above the bottom of the footing shall be constructed, inspected, and paid for using the building technical specifications.

BUILDING TECHNICAL SPECIFICATIONS. The portions of the contract that relate to the construction of any building as part of the work, including, but not limited to, the architectural, structural, mechanical, and electrical features of such work, located within the building boundary line and above the footing elevation. Building technical specifications will not apply to items of work specifically identified as exceptions under specification section S-142.

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 *Alaska Flight Information Supplement*, 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 PLAN (CSP). ~~A Contract document that specifies methods of controlling the operations of the Contractor, subcontractors, and suppliers so as to provide for (1) safety of workers, equipment, and public, (2) the movement of aircraft in the Air Operations Areas of the airport, and (3) the least inconvenience to traffic.~~ A plan that sets forth guidelines for operational safety on airports during construction.

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. Contract time may be specified either in calendar days or by completion date.

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".

DEFECTIVE. Work that is unsatisfactory, faulty, deficient, or does not conform with regulatory requirements or the Contract documents.

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

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.

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 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. They may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Refer to the following website to determine the status of replaced Federal Specifications: http://apps.fss.gsa.gov/pub/fedspecs/index.cfm

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.

HOLIDAYS. State of Alaska legal holidays are:

1. New Year's Day - January 1
2. Martin Luther King, Jr. Day - Third Monday in January
3. Presidents' Day - Third Monday in February
4. Seward's Day - Last Monday in March
5. Memorial Day - Last Monday in May
6. Independence Day - July 4
7. Labor Day - First Monday in September
8. Alaska Day - October 18
9. Veteran's Day - November 11
10. Thanksgiving Day - Fourth Thursday in November
11. Christmas Day - December 25
12. Every Sunday
13. 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, 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, Sunday and the following Monday are both legal holidays (See AS 44.12).

INDEPENDENT ASSURANCE (IA). Activities that are an unbiased and independent evaluation of all the sampling and testing (or inspection) procedures used in the quality assurance program. [IA provides an independent verification of the reliability of the acceptance (or verification) data obtained by the agency and the data obtained by the contractor. The results of the IA testing or inspection are not to be used as a basis of acceptance. IA provides information for quality system management.]

INSPECTOR. The Engineer's representative authorized to make detailed inspections of Contract performance and materials.

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 with a total value of 5 percent or more of the Contract award amount.

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 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 WAQTC FOP for AASHTO T27/T 11 on the minus 3-inch material, and has a plastic index of 6 or less as determined by WAQTC FOP for AASHTO T 90.

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. There may be separate drawings for work inside and outside of the building boundary line.

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.

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.

QUALITY ASSURANCE (QA). (1) All those planned and systematic actions necessary to provide confidence that a product or facility will perform satisfactorily in service; or (2) making sure the quality of a product is what it should be. [QA addresses the overall process of obtaining the quality of a service, product, or facility in the most efficient, economical, and satisfactory manner possible. Within this broad context, QA includes the elements of quality control, independent assurance, acceptance, dispute resolution, etc. The use of the term QA/QC or QC/QA is discouraged and the term QA should be used. QA involves continued evaluation of the activities of planning design, development of plans and specifications, advertising and awarding contracts, construction, and maintenance, and the interactions of these activities.]

QUALITY ASSURANCE SPECIFICATIONS. Specifications that require contractor quality control and agency acceptance activities throughout production and placement of a product. Final acceptance of the product is usually based on a statistical sampling of the measured quality level for key quality characteristics. [QA specifications typically are statistically based specifications that use methods such as random sampling and lot-by-lot testing, which let the contractor know if the operations are producing an acceptable product.]

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.

REGULATORY REQUIREMENTS. Laws, rules, regulations, ordinances, codes, or orders, including requirements of permits, issued by a governmental entity with lawful authority over a matter.

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.

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.

SCHEDULE OF VALUES. A document submitted by the Contractor to the Engineer for approval. The approved document establishes the values for separate work items that comprise the total contract price for a building included in the work.

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 which include, but are not limited to, written technical descriptions of materials, equipment, construction systems, standards and workmanship, and administrative and procedural details related to the work.

STANDARD SPECIFICATIONS. A book or electronic file of specifications approved by the Department for general application and repetitive use. Standard specifications may include General Contract Provisions, and separate specifications for work inside and outside the building boundary line.

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; and (3) the Engineer has issued a letter of substantial completion.

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

Notwithstanding the forgoing paragraphs, for a building included in the work substantial completion is the point at which the building (1) can be safely and effectively used by the public or occupied for the purpose that it was intended, without further delays, disruption, or other impediments; (2) all agencies that issue approvals before occupancy have approved the building for occupancy; and (3) the Engineer has issued a letter of substantial completion.

The terms "substantially complete" and "substantially completed" as applied to the work mean substantial completion.

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). ~~A Contract document that specifies methods of routing pedestrian and/or vehicular traffic through or around a construction area, including specifying the location of all traffic control devices, for work outside the air operations area.~~ Also referred to as "Highway Traffic Control Plan". A drawing or drawings indicating the method or scheme 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 20

BIDDING REQUIREMENTS AND CONDITIONS

20-01 QUALIFICATION OF BIDDERS. A bidder shall:

a. On wholly state-funded projects, submit evidence of Contractor Registration, under AS 08.18, and valid Alaska Business License at the time designated for bid opening;

b. On federal-aid projects, submit evidence of Alaska Business License and Contractor Registration prior to award; and

c. When requested, submit a completed Contractor's Questionnaire (Form 25D-8) stating previous experience in performing comparable work, business and technical organization, financial resources, and equipment available to be used in performing the work.

All firms desiring to participate in DOT&PF construction projects must register annually by submitting a completed Bidder Registration (Form 25D-6).

20-02 CONTENTS OF BID PACKAGE. Upon request, the Department will furnish prospective bidders with a bid package, at the price stated in the Invitation To Bid.

The bid package includes the following:

a. Location and description of the project;

b. Estimates of quantities of work and materials to be furnished;

c. Schedule of contract items for which bid prices are invited;

d. Time in which the work must be completed

e. Amount of the bid guaranty;

f. Date, time, and place for the bid opening;

g. Plans and specifications; and

h. Bid forms.

Unless otherwise stated in the bid package, the Plans, Specifications, permits, forms and any other documents designated in the bid package are considered a part of the bid whether attached or not.

20-03 INTERPRETATION OF QUANTITIES IN BID SCHEDULE. Bid prices shall be based on the estimated quantities shown in the bid schedule. Quantities of work to be done and materials to be furnished are approximate and are prepared only for the comparison of bids. These quantities may increase, decrease, or be eliminated. Payment for unit price items will be made for the actual accepted quantities of work performed and materials furnished under the Contract, as determined using the method of measurement specified in the Contract.

20-04 EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, AND WORK SITE. Bidders shall examine the work site and all Contract documents before preparing a bid. Submitting a bid is a binding representation that the bidder has examined the work site, is aware of the conditions to be encountered, and

has examined and understands all of the Contract documents, including plans and specifications. Bidders shall examine the bidding requirements listed under Subsection 50-06 Utilities.

The records of geotechnical investigations including boring logs, test results, geology data reports, soil reports, material site reports, and geotechnical reports included in a bid package or made accessible to bidders or Contractors, are for information purposes only. These records are not part of the Contract. These records indicate subsurface conditions only at specific locations and times, and only to the depths penetrated. They do not necessarily reflect variations in soil, rock or groundwater conditions that may exist between or outside such locations. Actual conditions may differ from what is shown in the records. Material sources referenced in these records may not contain materials of sufficient quantity or quality to meet project requirements. The accessibility of these records does not constitute approval, nor guarantee suitability of soils or sources, or the rights to use sources for this project, except as specifically provided in Subsections 60-02.d.(2) Mandatory Sources and 60-02.d.(3) Designated Sources. The records shall not substitute for independent investigation, interpretation, or judgment of the bidder or contractor. The Department is not responsible for any interpretation or conclusion drawn from its records by the bidder or Contractor.

Bidders and Contractors shall examine Subsection 60-02 Material Sources for further information about material source development.

Any questions about bidding procedures, site conditions, or Contract requirements must be submitted in writing to the persons designated on the Invitation To Bid. Questions must be submitted in sufficient time to get a reply before submitting a bid. No oral responses or other oral statements are binding on the Department. Any response to a material question shall be issued by addendum sent to all bidders.

20-05 PREPARATION OF BID. Bids shall only be submitted on the forms furnished by the Department or legible copies of the Department's forms. All entries shall be legible and in ink or type. Bidders shall:

a. Enter all prices required on the Bid Schedule, in figures;

b. Enter a unit price for each contract item for which a quantity is given;

c. Enter the products of the respective unit prices and quantities in the column provided;

d. Enter lump sum prices for lump sum contract items in the column(s) provided; and

e. Enter the total amount of all contract items for the basic bid and, when specified, any alternates.

When a bid item contains a choice to be made by the bidder, the bidder shall indicate a choice according to the Specifications for that item. No further choice is permitted.

The bid must be signed in ink by the person or persons authorized to sign the Contract for the bidder. If a bidder is a corporation, the bid must be signed by a corporate officer or agent with authority to bind the corporation. If a bidder is a partnership, a partner must sign. If the bidder is a joint venture, each principal member must sign. If a bidder is a sole proprietorship, the owner must sign. Each person signing the bid must initial any changes made to entries on the bid forms.

For multiple-project bid openings, bidders may limit the total dollar amount or number of projects to be accepted by completing the following statement and adding it to the Bid Form for at least one of the projects being bid. The Department will then determine which of the low bids it will accept, up to the total indicated.

"We wish to disqualify all of our successful bids at this bid opening which exceed the total of $_____ or ____ contracts and hereby authorize the Department to determine which bids to disqualify, based on this limit."

20-06 NONRESPONSIVE BIDS.

a. A bid shall be rejected as nonresponsive if it:

(1) Is not properly signed by an authorized representative of the bidder in ink and in a legally binding manner;

(2) Contains unauthorized additions, conditional or alternative bids, or other irregularities that make the bid incomplete, indefinite, or ambiguous;

(3) Includes a reservation of the right to accept or reject any award, or to enter into a contract pursuant to an award, except for an award limitation under Subsection 20-05;

(4) Fails to include an acceptable bid guaranty with the bid;

(5) Is materially unbalanced; or

(6) Fails to meet any other material requirement of the Invitation To Bid.

b. A bid may be rejected as nonresponsive, in the Department's discretion, if it:

(1) Is not typed or completed in ink;

(2) Fails to include an acknowledgement of receipt of each addendum by assigned number and date of issue; or

(3) Is missing a bid price for any pay item, except when alternate pay items are authorized.

20-07 BID GUARANTY. Bids shall be accompanied by a bid guaranty in the amount specified on the Invitation To Bid. The guaranty shall be unconditionally payable to the State of Alaska and shall be in the form of an acceptable Bid Bond (Form 25D-14), or a certified check, cashier's check, or money order.

The surety of a Bid Bond may be any corporation or partnership authorized to do business in Alaska as an insurer under AS 21.09. A legible power of attorney shall be included with each Bid Bond.

An individual surety will not be accepted as a bid guaranty.

20-08 DELIVERY OF BIDS. Bids shall be submitted in the envelope furnished by the Department, or one of the same general size and shape that has the same identifying information. The envelope shall clearly indicate its contents and the designated address, as shown on the Invitation to Bid. Bids for other work may not be included in the envelope. Electronic or faxed bids will not be considered, unless specifically called for in the Invitation to Bid.

20-09 WITHDRAWAL OR REVISION OF BIDS. Bidders may withdraw or revise a bid in writing delivered by mail or by fax, provided that the designated office receives the withdrawal or revision before the time set for opening of bids. Revisions shall be submitted on the forms furnished by the Department or legible copies of the Department's forms.

Revisions shall include both the modification of the unit bid price and the total modification of each item modified, but shall not reveal the amount of the total original or revised bids.

20-10 PROTEST OF INVITATION TO BID. An interested party, as defined in AS 36.30.699, may protest an Invitation to Bid before the bid opening according to AS 36.30.560 and AS 36.30.565. Submit a protest to the Contracting Officer.

20-11 ADDENDA REQUIREMENTS. The Department will issue addenda if it determines, in its discretion, that clarifications or changes to the Contract documents or bid opening date are needed. The Department may send addenda by any reasonable method such as mail, courier, fax, or may post the addenda on its web site. Unless picked up in person or included with the bid documents, addenda or notice that an addenda has been issued will be addressed to the individual or company to whom bidding documents were issued and sent to the address or fax number on the plan holders' list. Notwithstanding the Department's efforts to distribute addenda, bidders are responsible for ensuring that they have received all addenda affecting the Invitation To Bid. Bidders must acknowledge all addenda received, either on the Bid Form or by fax prior to the scheduled time of bid opening. If a bidder received no addenda, the bidder shall enter "None" on the Bid Form.

20-12 RECEIPT AND OPENING OF BIDS. The Department will only consider bids, revisions, and withdrawals received before the scheduled time of bid opening.

Bids will be opened and read publicly at the time and place indicated in the Invitation to Bid. The Department is not responsible for prematurely opening or failing to open bids that are improperly addressed or identified.

20-13 RESPONSIBILITY OF BIDDERS. The Department may find a bidder is nonresponsible for any one of the following reasons, but is not limited in its responsibility analysis to the following factors:

a. Evidence of bid rigging or collusion;

b. Fraud or dishonesty in the performance of previous contracts;

c. More than one bid for the same work from an individual, firm, or corporation under the same or different name;

d. Unsatisfactory performance on previous or current contracts;

e. Failure to pay, or satisfactorily settle, all bills due for labor and material on previous contracts;

f. Uncompleted work that, in the judgment of the Department, might hinder or prevent the bidder's prompt completion of additional work, if awarded;

g. Failure to reimburse the state for monies owed on any previous contracts;

h. Default under previous contracts;

i. Failure to submit evidence of registration and licensing;

j. Failure to comply with any qualification requirements of the Department;

k. Engaging in any activity that constitutes a cause for debarment or suspension under the State Procurement Code (AS 36.30) or submitting a bid during a period of debarment;

l. Failure to satisfy the responsibility standards set out in state regulations;

m. Lack of skill, ability, financial resources, or equipment required to perform the contract; or

n. Lack of legal capacity to contract.

Nothing contained in this section deprives the Department of its discretion in determining the lowest responsible bidder.

20-14 FOREIGN TRADE RESTRICTION. The Contractor by submission of an offer and/or execution of a contract, certifies that it:

a. Is not owned or controlled by one or more citizens or nationals of a foreign country included in the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR);

b. Has not knowingly entered into any contract or subcontract for this project with a contractor that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens or nationals of a foreign country on said list; and

c. Has not procured any product nor subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.

Unless the restrictions of this clause are waived by the Secretary of Transportation according to 49 CFR 30.17, no contract shall be awarded to a contractor who is unable to certify to the above. If the Contractor knowingly procures or subcontracts for the supply of any product or service of a foreign country on the said list for use on the project, the FAA may direct, through the Department, cancellation of the contract at no cost to and with no damages available from the Department or the Federal government.

The Contractor shall incorporate this provision for certification without modification in each contract and in all lower tier subcontracts. The Contractor shall require subcontractors to provide immediate written notice to it if the subcontractor learns that its certification was erroneous, or has become erroneous, by reason of changed circumstances. The Contractor may rely upon the certification of a prospective subcontractor unless it has knowledge that the certification is erroneous.

The Contractor shall provide immediate written notice to the Department if the Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances.

This certification is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the FAA may direct, through the Department, cancellation of the contract or subcontract for default at no cost to, and with no damages available from, the Department or the Federal Government.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

This certification concerns a matter within the jurisdiction of an agency of the United Stated of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

20-15 MANDATORY POST-AWARD CONFERENCE. There will be a mandatory post-award conference held in Ouzinkie prior to the Contractor beginning work. The Contractor awarded the Ouzinkie Airport Relocation Stage II project is required to attend the post-award conference. All costs incurred by the Contractor to attend this conference, including air transportation, are at his expense. The Department will schedule the post-award conference and notify the Contractor at least 7 days prior to the conference date. The Department is not liable for delays or rescheduling of the post-award conference due to unforeseen circumstances. The proposed agenda for the conference is attached as Appendix K and identifies information the Contractor will be required to present.

SECTION 30

AWARD AND EXECUTION OF CONTRACT

30-01 CONSIDERATION OF BIDS. After the bids are opened and read, the bids will be mathematically checked and compared on the basis of the sum of the products of the bid schedule quantities and the unit bid prices. The unit bid prices govern if there is an error in extending the unit bid prices, or in totaling the extensions, or if an extension is missing. The results of the bid comparisons will be made available to the public as soon as practicable.

Until the Award, the Department may reject any or all bids, waive minor informalities or advertise for new bids without liability to any bidder if the Department, in its discretion, determines that to do so is in the best interests of the state.

A bidder may request withdrawal of a bid after opening and before the Award only according to AS 36.30.160(b) and State procurement regulations. Submit the request to the Contracting Officer.

An interested party, as defined in AS 36.30.699, may protest a proposed Award of contract as per AS 36.30.560 and AS 36.30.565. Submit the protest to the Contracting Officer.

30-02 SUBCONTRACTOR LIST. The apparent low bidder shall submit a completed Subcontractor List, Form 25D-5, within five working days following receipt of written notification by the Department that it is the low bidder.

An apparent low bidder who fails to submit a completed Subcontractor List form within the time allowed will be declared nonresponsible and may be required to forfeit the bid security. The Department will then consider the next lowest bidder for award of the Contract.

If a bidder fails to list a subcontractor, or lists more than one subcontractor for the same portion of work, and the value of that work is in excess of one-half of one percent of the total bid amount, the bidder agrees to perform that portion of work without a subcontractor and represents that it is qualified to perform that work.

A bidder who lists as a subcontractor another contractor who, in turn, sublets the majority of the work required under the Contract, violates this subsection.

A bidder or Contractor may, without penalty, replace a listed subcontractor who:

a. Fails to comply with licensing and registration requirements of AS 08.18;

b. Fails to obtain a valid Alaska business license;

c. Files for bankruptcy or becomes insolvent;

d. Fails to execute a subcontract for performance of the work for which the subcontractor was listed, and the bidder acted in good faith;

e. Fails to obtain bonding acceptable to the Department;

f. Fails to obtain insurance acceptable to the Department;

g. Fails to perform the subcontract work for which the subcontractor was listed;

h. Must be replaced to meet the bidder's required state or federal affirmative action requirements;

i. Refuses to agree or abide with the bidder's labor agreement; or

j. Is determined by the Department to be not responsible.

In addition to the circumstances described above, a Contractor may in writing request permission from the Department to add a new subcontractor or replace a listed subcontractor. The Department will approve the request if it determines in writing that allowing the addition or replacement is in the best interest of the State.

A bidder or Contractor shall submit a written request to add a new subcontractor or replace a listed subcontractor to the Contracting Officer a minimum of five working days before the date the new subcontractor is scheduled to begin work on the construction site. The request must state the basis for the request and include supporting documentation acceptable to the Contracting Officer.

If a bidder or Contractor violates this Subsection, the Contracting Officer may:

a. Cancel the Contract after Award without any damages accruing to the Department; or

b. After notice and a hearing, assess a penalty on the bidder or Contractor in an amount not exceeding 10 percent of the value of the subcontract at issue.

30-03 AWARD OF CONTRACT. The Department will award the Contract to the lowest responsible and responsive bidder unless it rejects all bids. The Department will notify all bidders in writing of its intent to award.

The Department will notify the successful bidder in writing of its intent to award the Contract and request that certain required documents, including the Contract Form, bonds, and insurance be submitted within the time specified. The successful bidder's refusal to sign the Contract and provide the requested documents within the time specified may result in cancellation of the notice of intent to award and forfeiture of the bid security.

If an award is made, it will be made as soon as practicable and usually within 40 days after bid opening. Award may be delayed due to bid irregularities or a bid protest, or if the award date is extended by mutual consent. Bids shall be valid for 120 days after bid opening, and may be extended by mutual consent.

For AIP contracts, no award shall be made until the FAA has concurred in the Department's recommendation to make such award and has approved the Department's proposed contract to the extent that such concurrence and approval are required by 49 CFR Part 18.

30-04 RETURN OF BID GUARANTY. The Department will return bid guaranties, other than bid bonds:

a. To all except the two lowest responsive and responsible bidders, as soon as practicable after the opening of bids; and

b. To the two lowest responsive and responsible bidders immediately after Contract award.

30-05 PERFORMANCE AND PAYMENT BONDS. The successful bidder shall furnish all required Performance and Payment Bonds on forms provided by the Department for the sums specified in the Contract. If no sum is specified, the successful bidder shall comply with AS 36.25.010. The Surety on each bond may be any corporation or partnership authorized to do business in the state as an insurer under AS 21.09 or two ~~responsible~~ individual sureties approved by the Contracting Officer.

If individual sureties are used, two individual sureties must each provide the Department with security assets located in Alaska equal to the ~~specified~~ penal amount of each bond. ~~The net worth and the total value of the security assets of each individual surety shall not be less than the penal amount of the bond. In addition, each individual Surety, upon the Department's request, shall execute an affidavit if individual surety on a form provided by the Department. Each individual surety affidavit contains a Certificate of Sufficiency that must be signed by an official of an institution having full knowledge of assets and responsibilities of the~~

~~Surety.~~ Any costs incurred by the Contractor and the individual Surety are subsidiary and shall be borne by the Contractor or the individual Surety. In no event will the Department be liable for these costs.

Individual sureties shall provide security by one, or a combination, of the following methods:

a. **Escrow Account.** An escrow account with a federally insured financial institution, in the name of the Department. Acceptable securities include, but are not limited to, cash, treasury notes, bearer instruments having a specific value, or money market certificates.

~~b. **First Deed of Trust.** A first deed of trust with the Department named as beneficiary, against the unencumbered value of real property or an agreement by a second party, including deeds of trust, mortgage, lien, or judgment interests to subrogate their interests to the Department in the real property offered by the individual Surety. A title insurance policy, with the Department as a named beneficiary, and a current (within three months) professional appraisal or assessed valuation is required to ascertain the true value of the property offered as collateral. Fire and casualty insurance, with the Department as a named insured, and in limits and coverages acceptable to the Contracting Officer, are required if buildings or other valuable improvements are involved. The appraiser must acknowledge in writing that the appraisal is prepared for the benefit of the Department and the Department has the right to rely on its contents. The deed of trust must be recorded in the recording office where the property is located.~~

b. **Irrevocable Letters of Credit.** Irrevocable letters of credit with a financial institution approved by the Contracting Officer.

c. **Cashiers or Certified Check.** A cashier's check or certified check made payable to the State of Alaska issued by financial institutions approved by the Contracting Officer.

These bonds and security assets, as applicable, shall remain in effect for 12 months after the date of final payment or, if longer, until all obligations and liens under this Contract are satisfied, including, but not limited to, obligations under Subsection 70-19.

The Department may, in its discretion, notify the bonding company or Surety of any potential default or liability.

The Contractor shall substitute, within five working days, another bond or surety acceptable to the Department if an individual Surety or the Surety on any bond furnished in connection with the Contract:

a. Becomes insolvent or is declared bankrupt;
b. Loses its right to do business in any state affecting the work;
c. Ceases to meet Contract requirements;
d. Fails to furnish reports of financial condition upon request; or
e. Otherwise becomes unacceptable to the Department.

When approved by the Contracting Officer, the Contractor may replace:

a. An individual surety with a corporate surety; or
b. Posted collateral with substitute collateral.

Failure to maintain the specified bonds or to provide substitute bonds when required under this section may be grounds for withholding contract payments until substitute bonding is obtained, and may, in the Department's discretion, be grounds for declaring the Contractor in default.

30-06 INSURANCE REQUIREMENTS. The Contractor shall provide evidence of insurance with an insurance carrier or carriers satisfactory to the Department covering injury to persons and property suffered by the State of Alaska or by a third party as a result of operations under this contract by the Contractor or by any subcontractor. The Contractor's insurance shall provide protection against injuries to all employees of

the Contractor and the employees of any subcontractor engaged in work under this Contract. All insurance policies shall be issued by insurers that (i) are permitted to transact the business of insurance in the State of Alaska under AS 21 and (ii) have a financial rating acceptable to the Department. The Contractor shall notify the Engineer, in writing, at least 30 days before cancellation of any coverage or reduction in any limits of liability.

Where specific limits and coverages are shown, it is understood that they shall be the minimum acceptable. The requirements of this subsection shall not limit the Contractor's indemnity responsibility under Subsection 70-13. Additional insurance requirements specific to this contract are contained in the Special Provisions, when applicable.

The Contractor shall maintain the following policies of insurance with the specified minimum coverages and limits in force at all times during the performance of the Contract:

a. **Workers' Compensation:** as required by AS 23.30.045, for all employees of the Contractor engaged in work under this Contract. The Contractor shall be responsible for Workers' Compensation Insurance for any subcontractor who performs work under this Contract. The coverage shall include:

   (1) Waiver of subrogation against the state;

   (2) Employer's Liability Protection at $500,000 each accident/each employee and $500,000 policy limit;

   (3) "Other States" endorsement if the Contractor directly utilizes labor outside of the State of Alaska;

   (4) United States Longshore and Harbor Workers' Act Endorsement, whenever the work involves activity over or about navigable water; and

   (5) Maritime Employer's Liability (Jones Act) Endorsement with a minimum limit of $1,000,000, whenever the work involves activity from or on a vessel on navigable water.

b. **Commercial General Liability:** on an occurrence policy form covering all operations with combined single limits not less than:

   (1) $1,000,000 Each Occurrence;

   (2) $1,000,000 Personal Injury;

   (3) $2,000,000 General Aggregate; and

   (4) $2,000,000 Products-Completed Operations Aggregate.

c. **Automobile Liability:** covering all vehicles used in Contract work, with combined single limits not less than $1,000,000 each occurrence.

d. **Umbrella Coverage:** for Contract amounts over $5,000,000 not less than $5,000,000 umbrella or excess liability. Umbrella or excess policy shall include products liability completed operations coverage and may be subject to $5,000,000 aggregate limits. Further, the umbrella or excess policy shall contain a clause stating that it takes effect (drops down) in the event the primary limits are impaired or exhausted.

e. **Builder's Risk Insurance:** coverage on an "All Risk" completed value basis for any building that is part of the work, including "quake and flood", and all materials, supplies, and equipment that are intended for specific installation in the Project while such materials, supplies, and equipment are

located at the project site, in transit from port of arrival to project site and while temporarily located away from the project site.

The State of Alaska shall be named as an additional insured on policies required by paragraphs **b** thru **d** above. All of the above insurance coverages shall be considered to be primary and non-contributory to any other insurance carried by the State of Alaska, whether through self-insurance or otherwise.

In any contract or agreement with subcontractors performing work, the Contractor shall require that all indemnities and waivers of subrogation it obtains, and any stipulation to be named as an additional insured it obtains, shall also be extended to waive rights of subrogation against the State of Alaska and to add the State of Alaska as an additional named indemnitee and as an additional insured.

The apparent low bidder shall furnish evidence of insurance for worker's compensation, commercial general liability, automobile liability, and umbrella coverage (if required) to the Department before award of the Contract. Provide evidence of all other insurance coverages required under this Contract prior to commencement of work. The evidence shall be issued to the Department and shall be either a certificate of insurance or the policy declaration page with all required endorsements attached and must:

a. Denote the type, amount, and class of operations covered;
b. Show the effective (and retroactive) dates of the policy;
c. Show the expiration date of the policy;
d. Include all required endorsements;
e. Be executed by the carrier's representative; and
f. If a certificate of insurance, include the following statement:

"This is to certify that the policies described herein comply with all aspects of the insurance requirements of (Project Name and Number). The insurance carrier agrees that it shall notify the Engineer, in writing, at least 30 days before cancellation of any coverage or reduction in any limits of liability."

The Department's acceptance of deficient evidence of insurance does not constitute a waiver of Contract requirements.

Failure to maintain the specified insurance or to provide substitute insurance if an insurance carrier becomes insolvent, is placed in receivership, declares bankruptcy, or cancels a policy may be grounds for withholding Contract payments until substitute insurance is obtained, and may, in the Department's discretion, be sufficient grounds for declaring the Contractor in default.

30-07 EXECUTION AND APPROVAL OF CONTRACT. The successful bidder shall execute and return the Contract Form and all other required documents to the Department within the time specified, or within 15 days after receipt by the bidder if no time is specified. A contract is awarded only after it has been signed by the Contracting Officer.

30-08 FAILURE TO EXECUTE CONTRACT. If the successful bidder fails to appropriately execute and return the Contract Form and other documents within time specified, as required above, the Department may cancel the intent to award and keep the bid guaranty. The Department will then, in its discretion, award the Contract to the next lowest responsive and responsible bidder or readvertise the work.

30-09 ORAL STATEMENTS. The written terms of the Contract are binding. No oral statement of any person shall, in any manner or degree, modify or otherwise affect, change, or amend the terms of the Contract.

30-10 INTEGRATED CONTRACT. This Contract is an integrated document and contains the complete agreement and understanding of the parties. There are no unwritten agreements or understandings between the parties. Changes ordered or agreed upon, Directives given, or Equitable Adjustments issued under this Contract, and all other matters affecting the Contract, must be in writing in order to be binding and effective.

SECTION 40

SCOPE OF WORK

40-01 INTENT OF CONTRACT. The intent of the Contract is to provide for the construction and completion of every detail of the described work. The Contractor shall furnish all labor, material, supervision, equipment, tools, transportation, supplies, and other resources required to complete the work in the time specified and according to the Contract. The Contractor is responsible for the means, methods, techniques, sequence or procedures of construction, safety, quality control, and to perform or furnish the work in accordance with the contract documents.

40-02 CHANGES.

a. **Within Contract Scope.** The Engineer may order changes within the general scope of the Contract at any time, and without notice to sureties, including altering, ordering additions to, or ordering deletions of quantities of any item or portion of the work. These changes shall be made by a written Change Order and shall not invalidate the Contract or release the sureties.

   (1) If the change does not materially differ in character or unit cost from specified Contract work, the Contractor shall perform the work at the original contract measurement methods and prices, subject to the provisions of Subsection 90-04.

   (2) If the change is materially different in character or unit cost from that specified in the Contract, a new Contract Item will be established, and an equitable adjustment to Contract price and Contract time shall be calculated by one of the following methods:

      (a) The Engineer and Contractor agree upon an adjustment to Contract price and Contract time, and the Engineer issues a change order for the described work;

      (b) The Engineer requires the Contractor to proceed with the described work, with an adjustment to contract price and contract time, calculated by time and materials basis under Subsection 90-05, and the Engineer issues a change order for the work. The Contractor shall keep complete daily records of the cost of such work; or

      (c) The Engineer may issue a unilateral Change Order requiring the Contractor to proceed with the work with an adjustment to the payment amount or Contract time based on the Engineer's estimate of reasonable value. The Contractor shall keep complete daily records of the cost of such work.

   (3) If the Engineer eliminates a Contract item, the Contractor shall accept compensation under Subsection 90-09.

b. **Outside Contract Scope.** Changes determined to be outside the general scope of the Contract shall be made only by Supplemental Agreement issued according to AS 36.30 and the State's procurement regulations. Additional bonding or insurance may be required.

c. **Cost and Pricing Data.** Before a Change Order or Supplemental Agreement covering work for which there is no established Contract price will be approved, the Contractor shall submit detailed cost or pricing data regarding the changed work. The cost or pricing data shall include an itemization of production rates and all costs including labor, materials, and equipment required for the work. The Contractor shall certify that the data submitted are, to the best of its knowledge and belief, accurate, complete, and current as of a mutually agreed date and that the data will continue to be accurate and complete during the performance of the changed work.

40-03 DIFFERING SITE CONDITIONS. The Contractor shall immediately notify the Engineer in writing and specifically describe the alleged differing site condition if the Contractor discovers:

a. Subsurface or latent physical conditions at the site, differing materially from those shown in the Contract documents, that could not have been discovered by a careful examination of the site; or

b. Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

Failure to give the Engineer immediate written notice of the alleged differing site condition as required under this section constitutes a waiver of any future claim arising from or relating to the alleged differing site condition.

Unless otherwise directed by the Engineer, the Contractor shall leave the affected area undisturbed and suspend work in that area until the Engineer investigates the conditions.

If the Engineer finds that such conditions differ materially and increase or decrease the cost of, or the time required for, performance of the Contract, the Engineer will prepare a Change Order for an Equitable Adjustment to the Contract. The Contractor shall cooperate with the Engineer's preparation of the Change Order.

If the Contractor and the Engineer are unable to reach an agreement concerning the alleged differing site condition, the Contractor may file a claim under Subsection 50-17.

The Contractor shall keep accurate and detailed records of the actual cost of the work done as a result of the alleged differing site condition and shall allow the Engineer access to those records. Failure to keep records, to provide the Engineer with access to those records, or to give the notice required above will bar any recovery for the alleged differing site condition.

40-04 USE OF MATERIALS FOUND ON THE WORK. Before using borrow, the Contractor shall utilize Useable Excavation to construct the embankment layer on the project. Useable Excavation is stone, gravel, sand, or other material that is determined suitable by the Engineer, and that is encountered within the lines and grades of the project. For excavating the Useable Excavation and constructing the embankment with Useable Excavation, the Contractor shall be paid only the unit bid price for excavation. Hauling, placing, compacting and other activities required to construct the embankment with Useable Excavation shall be subsidiary to excavation, and the Contractor shall not be paid additional sums for those activities. The Engineer may approve the use of borrow when Useable Excavation is not available.

The Engineer may authorize the Contractor to use the Useable Excavation for Contract items other than construction of embankment, and the Contractor shall be paid both for the excavation of the Useable Excavation and for the other Contract Item for which it is acceptably used. If this action results in a shortage of embankment material:

a. The Contractor shall replace the Useable Excavation used for Contract items other than embankment, on a yard for yard basis with borrow acceptable to the Engineer; and

b. This replacement shall be at the Contractor's expense and at no additional cost to the Department. The Contractor shall pay any royalties required for the borrow.

The Contractor shall not excavate or remove any material that is within the project limits but outside the lines and grades, without written authorization from the Engineer.

In the event the Contractor has processed material from state-furnished sources in excess of the quantities required for performance of the Contract, the Department may retain possession of the surplus processed materials, including any waste material produced as a by-product, without obligation to pay the Contractor for processing costs. When the surplus materials are in a stockpile, the Engineer may direct the Contractor to leave the materials in the stockpile, level the stockpile(s) or remove the materials and restore the premises to a satisfactory condition at no additional cost to the Department.

The Contractor may temporarily use material from a structure that is designated to be removed to erect a new structure, but shall not cut or otherwise damage such material without the Engineer's approval.

40-05 MAINTENANCE OF TRAFFIC. It is the explicit intention of the Contract that the safety of aircraft, the public, the airport's equipment and personnel, and the Contractor's equipment and personnel, shall be the most important consideration. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas of the airport, except as specifically provided in this Contract, with respect to its own operations and the operations of all its subcontractors. It is further understood and agreed that the Contractor shall provide for the uninterrupted operation of visual and electronic signals (including power supplies thereto) used in the guidance of aircraft, whenever the airport is open to the arrival or departure of aircraft.

With respect to the Contractor's own operations and the operations of all the Contractor's subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying: personnel; equipment; vehicles; storage areas; and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, maintenance vehicles, or support vehicles at the airport.

When the Contract requires the maintenance of vehicular traffic on an existing roadway, the Contractor shall keep such roadway open to all traffic, and shall provide such maintenance as may be required to accommodate traffic and to keep the roadway smooth and even. The Contractor shall furnish, erect, and maintain barricades, warning signs, ~~flagpersons~~flaggers, and other traffic control devices in reasonable conformity with the *Manual on Uniform Traffic Control Devices for Streets and Highways* (published by the United States Government Printing Office) and the *Alaska Traffic Manual Supplement*, unless otherwise specified by the Department. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from abutting property or intersecting roadways, and as required in Subsection 50-13.

The Contractor shall make their own estimate of all labor, materials, equipment, and incidentals necessary for providing the maintenance of aircraft and vehicular traffic as specified in this subsection.

The cost of maintaining the aircraft and vehicular traffic specified in this subsection shall not be measured or paid for directly, but shall be subsidiary to the various contract items, except that G-700, G-710, and P-670 pay items, if included in the bid schedule, will pay directly for the traffic control measures and hazardous area barriers that are specifically described for payment under those items.

40-06 REMOVAL OF EXISTING STRUCTURES. The Contractor shall leave in place, work around and protect from damage existing structures encountered within the project lines and grades; unless such existing structures are to be removed, demolished, relocated, or salvaged.

Should the Contractor encounter an existing structure (above or below ground) in the work for which the disposition is not indicated on the Plans, the Contractor shall notify the Engineer prior to disturbing such structure. The Engineer will determine the disposition of existing structures so encountered according to the provisions of the contract.

The cost of working around and protecting existing structures, or removing existing structures including landfill waste fees, shall not be measured or paid for directly, but shall be subsidiary to the various contract items.

Structures that may be encountered within the project lines and grades shall be utilized in the work, and shall remain the property of the owner when so utilized in the work, unless otherwise indicated in the Contract.

40-07 CLEANUP. The Contractor shall remove all rubbish, solid waste, temporary structures, excess materials, and equipment from the project site, from state owned materials sources, and from all work areas before project completion.

40-08 VALUE ENGINEERING PROPOSALS BY CONTRACTOR.

a. **Purpose and Scope.** The purpose of this section is to encourage the Contractor to propose changes to Contract designs, materials, or methods based on the Contractor's experience and ingenuity. The Value Engineering Proposals (VEPs) contemplated are those that may result in immediate savings to the Department under this Contract without impairing essential functions and characteristics of the Project, including, but not limited to: service life, economy of operation, ease of maintenance, desired appearance, and safety. Cost savings on this project resulting from VEPs offered by the Contractor and accepted by the Department shall be shared equally between the Contractor and the Department.

   The following are not eligible for value engineering proposals: changes in the basic design of a pavement type, runway and taxiway lighting, visual aids, hydraulic capacity of drainage facilities, or changes in grade or alignment that reduce the geometric standards of the project.

b. **Submitting Proposals.** All VEPs must be in writing. The Contractor shall submit the following with each VEP:

   (1) A statement that the proposal is submitted as a Value Engineering Proposal under subsection 40-08;

   (2) A description of the difference between the existing Contract requirements and the proposed change, stating the comparative advantages and disadvantages of each, including effects on service life, economy of operations, ease of maintenance, desired appearance, and safety;

   (3) Drawings or specifications that show the proposed revisions relative to the original Contract requirements. The Contractor may submit schematics for conceptual approval of the proposal;

   (4) A detailed and complete cost estimate comparing the original estimated costs for performing the work under the existing Contract and under the proposed VEP;

   (5) A summary of the Contractor's development costs for the VEP, including costs for designing, testing, preparing and submitting the VEP;

   (6) A description and estimate of added costs the Department may incur in implementing the VEP, such as review, testing and evaluation of the VEP and Contract administration costs;

   (7) A date by which the Department must make a decision to obtain the cost savings projected in the VEP. The date identified must allow a reasonable time for the Department to conduct an adequate review and evaluation of the VEP and process a Change Order without affecting the Contractor's schedule;

   (8) A statement of the probable effect the VEP would have on the Contract completion time. The Department's approval of the VEP shall not change the Contract completion date unless a change to the completion date is specifically provided for in the Change Order authorizing the VEP; and

(9) A description of any previous use or testing of the proposed change and the conditions and results. If the proposal was previously submitted on another Department project, indicate the date, project name and number, and the action taken by the Department.

c. Conditions. VEPs will be considered only when all of the following conditions are met:

(1) The Contractor has not based any bid prices on the anticipated acceptance of a VEP. If the VEP is rejected, the Contractor shall complete the work at the Contract prices.

(2) VEPs, regardless of their approval status, become the property of the Department. The Contractor shall submit VEPs without use or disclosure restrictions. The Department shall have the right to use, duplicate or disclose the VEP and any data necessary to use the VEP on the Project, on any other project, and on any other Contracts. The Contractor shall identify any trade secret information, patented materials or proprietary processes that restrict use of the VEP.

(3) The Department is the sole judge as to whether a VEP qualifies for consideration and evaluation. It may reject any VEP that does not allow a reasonable time for adequate review and evaluation by the Department or that requires excessive time or costs for review, evaluations, or investigations, or which is not consistent with the Department's design standards and policies, safety considerations, land use restrictions, permit stipulations, right-of way limitations, or other essential criteria for the project. The Department may reject a VEP without obligation to the Contractor if it contains proposals that are already under consideration by the Department or that have already been authorized for the Contract.

(4) If additional information is needed to evaluate a VEP, the Contractor shall provide it in a timely manner. Failure to do so may result in rejection of the VEP.

(5) The Contractor may submit VEPs for an approved subcontractor if the Department makes reimbursement to the Contractor.

(6) If the Contractor hires a design professional to prepare the proposal, that professional must seal the documents and provide evidence of Professional Liability Insurance with limits acceptable to the Department.

(7) The Contractor shall not implement proposed changes before the Department accepts the VEP.

(8) The Department shall not consider VEPs to share in cost savings due to changes previously ordered or authorized under other Contract sections or for work already done.

(9) The Engineer shall reject all unsatisfactory work resulting from an accepted VEP. The Contractor shall remove all rejected work or materials, and shall reconstruct the work under the original Contract at the Contractor's sole expense under Subsection 50-11.

(10) Reimbursement for modifications to the VEP to adjust field or other conditions is limited to the total amount of the original Contract bid prices.

(11) The Department shall not be held liable for costs or delays due to the rejection of a VEP, including but not limited to the Contractor's development costs, loss of anticipated profits and increased material, labor or overhead costs.

d. Processing.

(1) The Engineer shall accept or reject the VEP, in writing, by the date the Contractor specifies, unless extended by mutual consent. If rejected, the Engineer will explain the reasons for

rejection. A VEP may be rejected if the Contractor allows the Department insufficient time to adequately review and evaluate it.

(2) The Contractor may withdraw or modify a VEP at any time before it is accepted.

(3) If the VEP is approved in concept (without final drawings and specifications), the Department may either undertake the re-design itself or issue the Contractor a limited notice to proceed, subject to mutual agreement, authorizing the final design. The notice to proceed will include reference to any pertinent design criteria, Department policies, and other limitations on the design or construction methods. Approval in concept does not constitute acceptance of the VEP and will not obligate the Department to accept or pay for the final design.

(4) If the final VEP is accepted, the Engineer will issue a Change Order under Subsection 40-02 incorporating the VEP into the Contract.

e. Payment. If the Department accepts the VEP, payment will be authorized as follows:

(1) The Department will make a direct payment for the changed work at the unit or lump sum agreed prices in the Change Order. Such prices will include reimbursement of the Contractor's costs to develop and submit the VEP, including overhead and profit.

(2) In addition, the Department will share the net savings with the Contractor in a separate lump sum contract item, VEP Incentive, GCP-40a. The amount of the VEP incentive will be equal to 50 percent of the net savings to the Department. The net savings are the difference between the original Contract price for the affected work and the cost of the revised work. For the purpose of this calculation, the cost of the revised work will include costs the Department may incur as a result of the VEP, such as review of the proposal, testing and evaluation, and added Contract administration costs. These costs will be estimated and agreed to in the Change Order.

(3) The VEP Incentive, contract item GCP-40a, will be paid on a prorated basis as the revised work is performed.

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 being performed improperly. The Engineer has authority to accept completed work, issue Directives, issue Interim Work Authorizations, issue Change Orders, and recommend Contract payments.

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

The Engineer has authority to suspend work for reasons listed under Subsection 80-06. If the suspension is to protect workers or the 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. 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 Contractor shall submit to the Engineer for approval five sets of 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 use full-size (22"x34") white paper with dark blue or black lines on all working and detail drawings.

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.

Although the Contractor shall conduct its operations according to the approved working drawings, 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~~

This contract may include two different sets of specifications and plans. Except for specific items of work specified under specification section S-142, one set of specifications and plans will apply to work outside the building boundary line and the second set of specifications and plans will apply to work within the building boundary line. The building boundary line is defined in Subsection 10-03.

For work within the building boundary line and above the bottom of the footing, unless otherwise specified under item S-142, the Contractor shall perform the work according to the building technical specifications, and payment for the work will be included in the building schedule of values. For work outside the building boundary line or below the bottom of the footing, the Contractor shall perform the work according to the contract unit prices for the work involved.

For work outside of the building boundary line, in case of a conflict calculated dimensions govern over scaled dimensions, and large scale details govern over small scale details. 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. Contents of Addenda
b. Special Provisions
c. Plans
d. Standard Specifications
e. Materials testing standards
f. FAA Advisory Circulars

For work within the building boundary line, in case of a conflict calculated dimensions govern over scaled dimensions, and large scale details govern over small scale details. 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. Contents of the Addenda
b. Special Provisions or Supplementary Conditions
c. General Contract Provisions
d. Schedules or lists of items required for the completion of the project, such as equipment, finishes, doors, or materials, in specifications or plans
e. Building Technical Specifications
f. Plans (Drawings) (with (1) having precedence over (2), (2) having precedence over (3), etc.)
    (1) Architectural drawings
    (2) Structural drawings
    (3) Mechanical drawings
    (4) Electrical drawings
    (5) Other drawings

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.

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 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 visual and electronic signals, including power supplies and Lighting used in the guidance of aircraft, whenever the airport is open to the arrival or departure of aircraft;

(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, the applicable completion dates or specific calendar days to complete the removal, adjustment, or relocation 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; The City of Ouzinkie (COO) owns and operates the electrical generation and distribution system in the City of Ouzinkie, Alaska.

(a) The COO will construct an electrical line extension from the village powerhouse to the new show removal equipment building (SREB). The line extension will follow the airport access

road and be within the road right-of-way. COO will install the line extension from Station 100+81, 50LT to Station 183+14, 34LT.

Coordinate with COO and provide the required clearing, grubbing, construction staking, traffic control, seeding, fertilizing, and erosion, sediment and pollution control prior to COO beginning construction.

Request locates from all utilities with facilities in the area a minimum of fourteen (14) days prior to excavation. Utility company telephone numbers area as follows:

Locate Call Center 278-3121 (Anchorage) or 800-478-3121 (Statewide). The locate call center will contact the following utilities directly:

ACS of the Northland (Telephone)
(907) 714-8777

Contact the following utilities directly:

City of Ouzinkie (COO) (Electrical)
(907) 680-2209 (telephone)
(907) 680-2223 (fax)

After substantial project completion and as approved by the Project Engineer, transfer periodic bills to the following:

i. Snow Removal Equipment Building(s)
Alaska Department of Transportation and Public Facilities
Building Maintenance
Attn: Mr. Al Gilbert, Superintendent (MS 2529)
PO Box 196900
Anchorage, AK 99519-6900
Phone: (907) 269-5983

ii. Electrical Enclosure for Runway Lighting System(s):
Alaska Department of Transportation and Public Facilities
Southwest M&O District
Attn: Mr. Troy LaRue, Superintendent (MS 2525)
PO Box 196900
Anchorage, AK 99519-6900
Phone: (907) 269-0751

Submit applications to City of Ouzinkie for permanent power and copy ADOT&PF addresses under paragraphs i. and ii. above.

(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 and the Engineer 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 traffic control plan;

(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~~

(17) Coordinate the Storm Water Pollution Prevention Plan (SWPPP) (Section P-157) 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 and the utility owner.

(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. When the work of this contract requires the closing of a runway that has visual or navigational aids, interruption of service to these aids, or displacement of a threshold, allow sufficient advance notice (through the Engineer) for the FAA to deactivate/activate these devices. Comply with subsection 80-04d FAA Systems Operations Control Center notification 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 provide to the Engineer daily written updates of all actions that may effect the operation of visual and electronic signals, lighting, or power supplies, used in the guidance of aircraft.

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. The survey work shall meet the requirements set forth in the *Alaska Construction Surveying Requirements*.

The Contractor shall provide all survey work including, but not limited to: project layout, cross sections, slope stakes, grade stakes, as-built measurements, and quantity measurements. Immediately upon completion of initial cross sections, the Contractor shall furnish reduced and checked survey notes to the Engineer. From time to time throughout the work, as requested by the Engineer, the Contractor shall take appropriate sections and shall provide the Engineer with reduced and checked notes from which quantity calculations for progress payment purposes can be accomplished. Notes shall be kept in a neat, orderly, and legible form according to professional surveying practices.

Upon completion of each phase of the work, the Contractor shall furnish the Engineer with all necessary measurements for completion of the as-built drawings. The Contractor shall include identification and

location of project features where actual locations differ from locations shown on the Plans. All original survey notes and field books shall become the property of the Department and shall be delivered to the Engineer as a condition to final payment on this contract.

The cost of surveying is to be subsidiary to the items of work for which surveying is required, except where a pay item for specified surveying work is included in the bid schedule.

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. 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 by 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 substantial completion (definition in Subsection 10-03). 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.

Avoid placing 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 preventative 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 and all edge lighting shall be in good working order. 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 acceptance (Subsection 50-14).

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 during construction and before the project is accepted as substantially complete 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 ACCEPTANCE. The Contractor may submit a written request for partial acceptance of a geographically separate unit of the project. The Engineer will accept the unit in writing before project completion if the Engineer inspects the unit and finds that the unit is substantially complete to Contract requirements, and acceptance is in the best interest of the State.

The Contractor may submit a written request for partial acceptance of a completed useable portion of the project. The Engineer may, in their discretion, accept the portion in writing before project completion if the Engineer performs an inspection of the portion and finds that the portion is substantially complete to Contract requirements, and acceptance is in the best interest of the State.

Partial acceptance of the unit or 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 except as listed under Subsection T-901-3.4 Maintenance of Seeded Areas. 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, except for work specified under Subsection T-901-3.4 Maintenance of Seeded Areas, 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 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 an Intent to Claim in writing to the Engineer.

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.

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. The Contracting Officer will issue written acknowledgement of the 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 the claim is made in good faith, that the supporting cost and pricing data are accurate and complete to the best of the Contractor's knowledge and

belief, and that the amount requested accurately reflects the Contract adjustment that the Contractor believes is due.

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.

50-18 ONE YEAR WARRANTY. If the Department finds that an item of work in a building is defective within one year of the date of the Engineer's letter of substantial completion of the building, or any longer period of time as may be prescribed by regulatory requirements, or any longer period required by the contract documents, the Department will provide written notice to the Contractor of the defect. The Contractor shall promptly, without cost to the Department and according to the Department's written instructions, correct the defective work.

If the Contractor does not promptly comply with the terms of the instructions, or in an emergency where delay would cause serious risk of damage to property or persons, the Department may remove, repair, or replace the defective work. The Contractor shall reimburse the Department's direct, indirect, and consequential costs of such removal, repair, or replacement. If the Contractor disagrees that it is liable for the removal, repair, or replacement of the defective work, refuses to reimburse the State for the removal, repair or replacement of the defective work, or does not pay the full amount of the costs of removal, repair, or replacement of the defective work, the Department shall file a claim against the Contractor under AS 36.30.620 with the subsequent adjudication of the claim under AS 36.30.620 through AS 36.30.631 and AS 36.30.670 through AS 36.30.687.

SECTION 60

CONTROL OF MATERIAL

60-01 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS. The Contractor shall furnish all materials required to complete the work except those specified to be furnished by the Department. The Contractor shall supply materials that are new and that meet Contract requirements. All manufactured materials shall be delivered and stored in their original containers and shall show the manufacturer's name, brand, and identifying number.

The Contractor shall furnish airport lighting equipment that conforms to the requirements of cited materials specifications. In addition, where an FAA specification for airport lighting equipment is cited in the Plans or Specifications, the Contractor shall furnish such equipment that is certified and listed under AC 150/5345-53, *Airport Lighting Equipment Certification Program*.

The Contractor shall notify the Engineer of proposed sources of materials at least 30 days before shipment, and shall submit to the Engineer and to the Department's State Materials Engineer a complete list of materials to be purchased from suppliers sufficiently in advance of fabrication or shipment to permit the Department to inspect the materials.

The Department's inspectors may inspect any materials, including those originating outside Alaska, at the supply source or other locations. Materials may be conditionally approved at the supply source or other location, but are subject to field inspection and may be ordered removed under Subsection 50-11 if they do not conform to Contract requirements. Inspectors are authorized to reject materials that do not conform to specifications until any issues can be referred to and decided by the Engineer. Inspectors will report their actions to the Engineer.

The Contractor shall submit a manufacturer's certificate of compliance for each item listed on the Material Certification List. The Engineer may authorize the use of materials based on a manufacturer's certificate of compliance, see Subsection 60-05. Materials incorporated into the project on the basis of a manufacturer's certificate of compliance may be tested at any time, whether in place or not, and, if they do not conform to Contract specifications, they may be rejected and ordered removed under Subsection 50-11.

The Engineer may authorize the use of materials listed in the Department's *Qualified Products List.* Materials incorporated into the project on the basis of the *Qualified Products List* may be tested at any time, whether in place or not, and, if they do not conform to Contract specifications, they may be rejected and ordered removed under Subsection 50-11.

The Contractor may request substitution of specified materials with equivalent materials. Requests for substitution shall be submitted to the Engineer, and shall include a manufacturer's statement that certifies, for each lot delivered:

a. Conformance to the specified performance, testing, quality or dimensional requirements; and

b. Suitability for the use intended in the Contract work.

When the Contractor makes an equivalent materials request related to any building material or building equipment included in the work, the Contractor shall certify in the request that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified, and be suited for the same use as the specified material. The Contractor's request shall state:

a. Whether the evaluation, approval or use of the proposed substitute will delay substantial completion of the work;

b. Whether acceptance of the substitute will require changes in any of the contract documents, including the project schedule;
c. Whether incorporation or use of the substitute in connection with the work is subject to payment of any license fee or royalty;
d. All instances where the proposed substitute will be incorporated into the work;
e. The identity of the available maintenance, repair, and replacement service; and
f. An itemized estimate of all costs that will result directly and indirectly from acceptance of such substitution, including costs of installation and maintenance, repair, and replacement costs during the life cycle of the building.

The Engineer will determine the acceptability of a proposed substitute for use in the project. If a substitute is approved, a Change Order will be executed. The Department is never required to accept substitution. The Contractor shall not incorporate substitute materials into the project without written approval from the Engineer. The Engineer may test substitute materials at any time, whether in place or not, and, if the substitute materials do not meet Contract specifications, they may be rejected and ordered removed under Subsection 50-11.

60-02 MATERIAL SOURCES.

a. General. The Contractor shall:

(1) Utilize Useable Excavation according to Subsection 40-04 before using material sources listed in Subsection 60-02.d. When there is insufficient useable excavation furnish additional required materials from sources of the Contractor's choice, except that the Contractor shall use a mandatory source when identified in the Contract;

(2) Produce a sufficient quantity of materials meeting the specifications to complete the project;

(3) As a subsidiary cost: clear and grub, strip, drill and blast, excavate, crush, sort, blend, screen, wash, stockpile, haul, and rehandle material as needed to produce and deliver the specified product;

(4) Determine the type of equipment and methods to be used;

(5) Expect variations in material quality within the deposits, and procure material only from acceptable portions of the deposit, regardless of source ownership; and

(6) Prevent erosion, sedimentation, and pollution within a materials source.

The Contractor agrees that:

(7) The costs to explore and develop material sources, including all production effort, are subsidiary to the cost of providing the specified material;

(8) The Engineer may order the Contractor to procure material only from certain portions of the source and may reject material from other portions of the source that does not conform to the specifications; and

(9) All material required may not be procurable from any one source and the Contractor may need to change between sources. That contingency is to be factored into the unit bid price for the Contract Item.

b. Inspection and Acceptance. The Contractor shall perform sampling and testing during materials processing and placement according to its Quality Control Plan (Subsection 60-03.a.) and shall obtain acceptable material samples from locations designated within the source.

The Department will sample and test materials to determine the quality of the source, at its expense, as part of its Acceptance Testing (Subsection 60-03.b.). The Department will reject materials when the samples do not meet specifications. The Department may reject a proposed materials site when samples do not meet specifications.

c. **Awareness Training.** The operator of the Contractor's sand and gravel surface mine or other similar materials source shall provide Site-Specific Hazard Awareness Training in compliance with 30 CFR 46.11 for all the Engineer's personnel before beginning operations. All other workers shall be given training in compliance with 30 CFR 46 before exposure to mine hazards. The training must be offered at each surface mine that will be used to supply processed aggregates. A qualified person must provide the training. The training shall be according to the operator's written training plan approved by the Mine Safety and Health Administration, covering the following items:

(1) Site-specific health and safety risks;
(2) Recognition and avoidance of hazards;
(3) Restricted areas;
(4) Warning and evacuation signals;
(5) Evacuation and emergency procedures;
(6) Other special safety procedures; and
(7) A site tour.

The Contractor shall require the Engineer's personnel to sign the *Visitor's Log Book* upon completion of the training to indicate that training was provided. Training is a subsidiary cost.

d. **Type of Sources.** The Contractor shall utilize Useable Excavation according to Subsection 40-04 before using material sources listed in this Subsection. When there is insufficient Useable Excavation, the Contractor shall furnish additional required materials from sources of the Contractor's choice, except that the Contractor shall use a mandatory source when identified in the Contract.

When there is insufficient Useable Excavation, the Contractor shall supply additional required material from the following sources:

(1) Contractor-Furnished Sources. For a material source that is a commercial plant as defined in Subsection 80-01.c.(1) the Contractor shall:

(a) Acquire the necessary rights and permits to obtain material from a commercial plant;

(b) Pay as subsidiary costs all related costs to obtain and use material from the source; and

(c) Be solely responsible for the quality and quantity of materials.

For all Contractor-Furnished sources that are not a commercial plant, the Contractor shall:

(d) Acquire the necessary rights and permits to take materials from the sources including state-owned sources that are not under the Department's control;

(e) Pay as subsidiary costs all related costs to obtain, develop, and use the sources, including but not limited to permit costs and mineral royalties;

(f) Be solely responsible for quality and quantity of materials; and

(g) Obtain all necessary rights, permits, and plan approvals before clearing or disturbing the ground in the material source.

No equitable adjustment or other compensation will be made for any additional costs, including increased length of haul, if the Contractor:

(h) Chooses to change material sources for any reason;

(i) Is unable to produce a sufficient quantity or quality of materials from Contractor-Furnished sources; or

(j) Encounters unexpected, unforeseen, or unusual conditions within Contractor-Furnished sources.

(2) Mandatory Sources. The Department may identify material sources in the Contract from which the Contractor is required to take a specified quantity of material. No other source will be permitted for that portion of material unless prior approval is obtained from the Engineer. The Contract will specifically define these sources as Mandatory Sources and define rights and stipulations for each site. The Department will provide a materials report that estimates quality and quantity of material for these sources.

The Contractor acknowledges that samples from within a source may not be representative of the entire source. The Contractor must expect variations of quality and quantity within the source and shall factor that contingency into the unit bid price for the material. No equitable adjustment will be paid for variations encountered within the source.

If it is subsequently found that the quality or quantity of material producible from a Mandatory Source is not as represented by the materials report, and a change of source is necessary for that reason alone, a Change Order with equitable adjustment will be made.

(3) Designated Sources. The Department may identify material sources in the Contract which are available to the Contractor but which the Contractor is not required to use. The Contract will specifically define these sources as Designated Sources and define rights and stipulations for each site. The Department will provide a materials report that estimates quality and quantity of material for these sources.

The Contractor acknowledges that samples from within a source may not be representative of the entire source. The Contractor must expect variations of quality and quantity within the source and shall factor that contingency into the unit bid price for the material. No equitable adjustment will be paid for variations encountered within the source.

If the Contractor elects to use a Designated Source, and it is subsequently found that the quality and quantity of material producible from that source is not as represented by the materials report, and a change of source is necessary for that reason alone, a Change Order with equitable adjustment will be made. If the Contractor chooses to change between or among sources for any other reason than quantity or quality of material, no equitable adjustment will be paid.

(4) Available Sources. The Department may identify other material sources that are available for use for the project by the Contractor. The Contract will specifically define these sources as Available Sources. The Department makes no guarantee as to quality or quantity of material in Available Sources. The Contractor is responsible for determining the quality and quantity of material, and if additional sources are needed. The Contractor shall be responsible for identifying the rights and stipulations for each site with the owner of the site.

When the Department furnishes copies of existing boring logs, test results, or other data in its possession concerning Available Sources, the Contractor is responsible for determining the

accuracy and completeness of this data, for any assumptions the Contractor makes based on this data, and for exploring all Available Sources to the Contractors satisfaction.

The Department makes no representation, guarantees, or warranty whatsoever, expressed or implied, as to:

(a) The quality or quantity of materials producible from an Available Source, even if such information is indicated in a Materials Report or Soils Investigation Report;

(b) Whether boring logs, test results or data reliably represent current existing subsurface conditions;

(c) Whether interpretations of the boring logs, test results, or other data are correct;

(d) Whether moisture conditions and indicated water tables vary from those found at the time borings were made;

(e) Whether the ground at the location of the borings was physically disturbed or altered after the boring was made; and

(f) The condition, materials, or proportions of the materials between borings, regardless of any subsurface information the Department may make available.

The availability of subsurface information from the Department shall not relieve the Contractor from any risks, or of any duty to make on-site examinations and investigations, or of any other responsibility under the Contract or as may be required by law.

No equitable adjustment will be made if the quality and quantity of material available from an Available Source is not as represented in any information provided by the Department, nor if a change of source is necessary for any other reason whatsoever. The use of Available Sources is entirely at the Contractor's option and the Contractor bears all risk associated with their decision to use an Available Source.

(5) Excluded Material Sources. Some material sources may not be considered acceptable regardless of location or ownership. The bid documents may identify some material sources excluded from use. The Department reserves the right to exclude any material source or any portion of a material source, at any time after Contract award, that is determined by material testing to be unsuitable for use on the project.

e. Rights, Permits and Plan Approvals for Material Sources. Before disturbing the site of a material source, the Contractor shall acquire and pay for all necessary rights, permits and plan approvals indicated in this Subsection and in Subsection 70-02. For each material site the Contractor shall:

(1) Acquire approval for a Mining and Reclamation Plan (MRP) or receive an exemption, according to AS 27.19. The MRP shall include:

(a) Plan and cross-sectional views of the site;

(b) Applicable boundaries or property lines;

(c) Areas and depths to be developed;

(d) Locations of access roads, stripping, sorting, and waste piles, crushing and plant sites, stockpile sites, drainage features, erosion and pollution control features; and

(e) Condition the Contractor will leave the site after the materials extraction is completed, including reseeding.

(2) Submit a SWPPP as required by Section P-157.

After completing work in a materials source, the Contractor shall finish and grade work areas to a neat, acceptable condition according to the approved MRP. Reclamation of a Contractor-furnished source will be in accord with the Contractor's MRP.

60-03 TESTING AND ACCEPTANCE. Materials are subject to inspection and testing by the Department at any time before, during, or after they are incorporated into the project. Use of untested materials is at the Contractor's risk. The Contractor shall remove and replace unacceptable material according to Subsection 50-11.

a. **QUALITY CONTROL.** The Contractor is responsible for the quality of construction and materials used in the work. Quality control is process control, and includes all activities that ensure that a product meets Contract specifications. Contractor quality control is subsidiary to the applicable items unless a contract item for Quality Control is established on the bid schedule.

The Contractor shall implement a Quality Control Program in conformance with Section GCP-100, Contractor Quality Control Program.

b. **ACCEPTANCE TESTING.** The Department has the exclusive right and responsibility for determining the acceptability of the construction and incorporated materials.

The Department will sample materials and perform acceptance tests at its expense. Copies of tests will be furnished to the Contractor upon request. When material is sampled by other than DOT&PF personnel or their agent(s), the sampling must be witnessed by, and possession of the sample immediately transferred to, DOT&PF personnel or their agent(s).

The Contractor shall not rely on the Department's acceptance testing for its quality control. The Department's acceptance testing is not a substitute for the Contractor's quality control. The Engineer may retest materials that have failed the Department's acceptance test, but is not required to do so.

Acceptance sampling and testing frequencies may be located in the Appendix to these Specifications, and are incorporated into the Contract.

60-04 PLANT INSPECTION. The Department may periodically inspect manufacturing methods, manufactured lots and materials at the source of production. The Department may approve, conditionally approve, or reject them.

The Contractor shall:

a. Notify the Department of the production and fabrication schedule at least 30 days before beginning work on any item requiring inspection, and notify the Department 48 hours before beginning production or fabrication;

b. Give the inspector full and safe access to all parts of the plant used to manufacture or produce materials; and

c. Cooperate fully and assist the inspector during the inspection.

Materials may be rejected if the Department requests a plant inspection and the materials are produced or fabricated without a plant inspection. The materials may be tested at any time before final acceptance, whether in place or not, and whether approved at a plant inspection or not. If the materials do not meet Contract specifications, they may be rejected and ordered removed under Subsection 50-11. If rejected

materials are incorporated into the project, the Department may require those materials to be removed and replaced at the Contractor's expense under Subsection 50-11.

60-05 CERTIFICATES OF COMPLIANCE. The Engineer may authorize the use of certain materials or assemblies based on a manufacturer's certificate of compliance. The certificate must state that the material or assembly fully complies with Contract requirements, include the project name and number, and be signed by the manufacturer. The certificate must accompany each lot of the materials or assemblies delivered to the project and must clearly identify the lot.

The Contractor shall submit a manufacturer's certificate of compliance, as required, for each item listed on the Materials Certification List (MCL) included in the Contract documents. The Contractor shall submit additional manufacturer's certificates of compliance if required by the Contract or by the Engineer. If the Specifications require a material certification that is not listed on the MCL, the Engineer reserves the right to add it.

Materials or assemblies incorporated into the project on the basis of a manufacturer's certificate of compliance may be tested at any time, whether in place or not, and, if they do not meet Contract specifications, they may be rejected and ordered removed under Subsection 50-11. The Engineer may refuse permission to incorporate materials or products into the project based on a manufacturer's certificate of compliance that does not meet specifications.

60-06 STORAGE OF MATERIALS. Materials shall be stored to preserve their quality and fitness for the work, and so they can be readily inspected. Materials inspected before storage may be inspected again, before or after being incorporated into the project. The Contractor shall:

a. Use only approved portions of the project site for storage of materials and equipment or plant operations;

b. Provide any additional space needed for such purposes without extra compensation;

c. Restore Department-owned or controlled storage and plant sites to their original condition without extra compensation;

d. Obtain the landowner's or lessee's written permission before storing material on private property, and furnish copies of the permission to the Engineer, if requested; and

e. Restore privately owned or leased storage sites, without extra compensation from the Department, to their original condition or as agreed to between the Contractor and the private owner.

60-07 DEPARTMENT-FURNISHED MATERIAL. Material furnished by the Department will be made available to the Contractor at a state yard or delivered at the locations specified in the Special Provisions.

The Contractor shall include the cost of handling and placing all materials after they are delivered in the Contract price for the item in connection with which they are used. The Contractor is responsible for all material delivered to the Contractor. Deductions will be made from any monies due the Contractor to make good shortages and deficiencies from any cause whatsoever, for any damage that may occur after delivery, and for demurrage charges.

60-08 SUBMITTAL PROCEDURE. The Contractor shall complete a Submittal Register, and shall submit it to the Engineer on forms provided by the Department. The Submittal Register shall list all working drawings, ~~catalog cuts, manufacturer's certifications, quality control testing plans,~~ schedules of work and other items required to be submitted to the Department by the Contractor including but not limited to Storm Water Pollution Prevention Plan, Quality Control Program, Progress Schedule, Utility Repair Plan, Blasting Plan, Mining Plan, annual EEO reports, DBE payment documentation and subcontracts. The register shall be filled out sequentially by bid item and shall allow at least three spaces between bid items. The intent of the Submittal Register is to provide a blueprint for the smooth flow of specified project documents.

Submit catalog cuts and manufacturer's certifications to the Engineer for review as required by the Materials Certification List (MCL) or by the Contract. The Engineer will track material submittals using the MCL. Choose materials or equipment in the L series of bid items that are FAA certified under AC 150/5345-53, Airport Lighting Equipment Certification Program; except for items not certified such as beacon towers and electrical duct. The Engineer will approve the L series bid items that meet contract requirements and are FAA certified under this AC without further review. For materials other than L series, you may submit for approval a material that is listed on the Qualified Products List, and if that material meets Contract requirements, the Engineer will grant approval without further review.

The number of copies required for submittals may be included in the specifications for individual bid items. If the number of copies of a submittal is not otherwise specified, three copies shall be required. On each sheet submitted to the Department, including working drawings, catalog cuts, manufacturer's certifications, etc., space shall be provided for Contractor and Department review stamps.

Each copy of each submittal shall include a Submittal Summary sheet. The Contractor may use forms provided by the Department or a similar form of the Contractor's choice as approved by the Department. The Contractor shall sign submittals and submit them to the Engineer. The Department will review submittals within 30 days after they are received. The Department will return submittals to the Contractor as either: approved, conditionally approved with the conditions listed, or rejected with the reasons listed. The Contractor may resubmit a rejected submittal to the Engineer with more information or corrections. The Department will review resubmittals within 30 days after they are received. The Contractor shall not order material or use working drawings that have not been approved by the Department. The Contractor shall be responsible for timely submittals. Failure by the Department to review submittals within the time given may be the basis for a request for extension of Contract time but not for additional compensation.

Payment for a specific contract item will not be made until the Department has received the Submittal Register for all items and approved all required submittals for that specific contract item.

60-09 BUY AMERICAN STEEL AND MANUFACTURED PRODUCTS.

a. The Contractor agrees that only domestic steel and manufactured products will be used by the contractor, subcontractors, material, men, and suppliers in the performance of this contract, as defined below.

b. The following terms apply to this clause:

(1) Steel and Manufactured Products. As used in this clause, steel and manufactured products include (1) those produced in the United States or (2) a manufactured product produced or manufactured in the United States, if the cost of its components mined, produced or manufactured in the United States exceeds 60% of the cost of all its components and final assembly has taken place in the United States. Components of foreign origin of the same class or kind as the products referred to in subparagraphs c.(1) or c.(2) shall be treated as domestic.

(2) Components. As used in this clause, components means those articles, materials, and supplies incorporated directly into steel and manufactured products.

(3) Cost of Components. This means the costs for production of the components, exclusive of final assembly labor costs.

c. Buy American Certificate. Execution and submission of the Buy American Certificate Form 25D-061, is required according to sections 30-07 and 30-08. If there are no exceptions to be listed on the certificate, the bidder shall enter "NONE" on the first line.

If exceptions are listed on the Buy American Certificate, they shall meet at least one of the following criteria for the certificate to be considered appropriately executed:

(1) Those products or materials that the U.S. Department of Transportation has determined, under the *Aviation Safety and Capacity Expansion Act of 1990,* are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality. (The current list is included on the back of Form 25D-061.)

(2) Those products or materials where the U.S. Department of Transportation has determined, under the *Aviation Safety and Capacity Expansion Act of 1990*, that domestic preference would be inconsistent with the public interest.

(3) Where inclusion of domestic material will increase the cost of the overall project contract by more than 25%.

60-10 OPERATION AND MAINTENANCE MANUALS. The Contractor shall provide operation and maintenance manuals for equipment and systems incorporated in the work. The Contractor shall submit one set of all manuals 60 days prior to substantial completion for review by the Department. The Contractor shall make corrections noted by the Department, and submit 5 complete sets of manuals 14 days prior to substantial completion.

The Contractor shall submit the manuals in neatly bound hard cover loose-leaf three ring binders. Include project name, Contractor's/Subcontractor's name, address and telephone number on each cover. Prepare data in the form of an instruction manual with a table of contents and a tabbed fly leaf for each section.

The Contractor shall provide a separate section for each product or system installed which includes the following:

a. Description of each unit or system and the component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests. Systems shall include:

(1) Heating System
(2) Fuel Oil Storage and Supply System
(3) Runway Lighting System

b. Product data with each sheet marked to clearly identify the specific products, component parts, and data applicable to installation. Delete inapplicable information. Product data shall include:

(1) Lighting Fixtures
(2) Wiring Devices
(3) Electric Power Distribution Components
(4) Runway Lighting System Components
(5) Thaw Wire and Heat Trace System Components
(6) Fuel Tank Capacity Diagram (converting stick readings at 6-inch vertical increments to gallons)

c. Include drawings to supplement product data and illustrate relations of component parts of equipment and systems. Show control and flow diagrams. Provide copies of all approved shop drawings. Drawings shall include:

(1) Equipment Storage Building Plans
(2) Electrical Equipment Enclosure Plans
(3) Runway Lighting One-line Control and Power Diagrams
(4) Electric Power One-line Diagrams
(5) Electric Power Panel Directories
(6) Thaw Wire and Heat Trace Systems

d. Type text as required to supplement product data and show logical sequence of operations for each procedure, incorporating the manufacturer's instructions.

e. Operating procedures to include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include any special operating instructions. Include reprogramming instructions for all programmable equipment. Systems shall include:

(1) Runway Lighting System
(2) Heating System
(3) Fuel Oil Storage and Distribution System

f. Maintenance requirements and repair data. Include routine procedures. Provide a guide for troubleshooting, disassembly, repair, and reassembly. Provide alignment, adjusting, and checking instructions. Maintenance and repair data shall include:
(1) Heating System
(2) Fuel Oil Storage and Distribution System

g. Supplies and replacement parts. For each item of equipment and each system list names, addresses, and telephone numbers of subcontractors and suppliers. Provide local source of supplies and replacement parts with complete nomenclature and commercial number of replacement parts. Provide a copy of manufacturer's recommended spare parts list for applicable equipment. Provide data for:
(1) Lamps for Runway Lighting System
(2) Lamps for Lighting Fixtures
(3) Fuel Oil System

h. Warranties. Include copies of warranties.

i. Tests. Include logs of all tests performed.

SECTION 70

LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

70-01 LAWS TO BE OBSERVED. The Contractor shall keep fully informed of, observe, and comply with all federal, state, and local laws, ordinances, and regulations, and all orders and decrees of bodies or tribunals having any jurisdiction or authority, that in any manner affect those engaged or employed on the work or which in any way affect the conduct of the work.

For any building included in the work, the Contractor shall comply with AS 35.10.025, which requires construction in accordance with applicable local building codes.

In addition to all other laws, the Contractor shall fully comply with all laws, regulations and permits issued by agencies of the United States and the State of Alaska when working in, over or adjacent to wetlands, tidelands, anadromous fish streams, eagle nests, navigable waters, or coastal waters.

In addition to other laws, the Contractor shall ensure that all work in, over or adjacent to navigable waters is conducted so that free navigation of the waterways is not obstructed and that existing navigable depths are not impaired, except as allowed by the U.S. Coast Guard and the U.S. Army Corps of Engineers.

The Contractor and the Surety shall defend, indemnify, and hold harmless the state and its representatives against any claim or liability related to violations of any laws, ordinances, regulations, orders, decrees or permits by the Contractor, the Contractor's agents, the Contractor's employees, a subcontractor at any tier, or a supplier or service provider.

The Contractor has the affirmative duty to keep informed of and comply with all laws. The Contractor is not entitled to and shall not rely on any Department employee's interpretation, whether oral or written, of any law, ordinance, regulation, order, or decree, or any permit issued by an agency other than the Department.

70-02 PERMITS, LICENSES, AND TAXES. The terms, conditions, and stipulations in permits obtained either by the Department or by the Contractor are made a part of this Contract. The Contractor shall obtain required building and fire safety permits, and pay required permit fees, except when the Department has already obtained the permits and attached them to the Contract.

The Department will:

a. Secure permits and licenses that the Department determines are required for the construction of the proposed project, and the use of mandatory sources, designated sources and designated waste disposal areas for the proposed project; and

b. Modify Department-acquired permits during the performance of the contract, if deemed necessary by the Engineer.

The Contractor shall:

a. Acquire any permits and licenses required to complete the project that are not acquired by the Department;

b. Provide qualified professionals to collect data or perform studies necessary to acquire permits for the use of sites not previously permitted;

c. Give all notices required for the prosecution of the work;

d. Abide by all permits and licenses whether acquired by the Department or by the Contractor;

e. Notify the Engineer promptly if any activity cannot be performed as specified in the permits, and cease conducting the activity until permit modifications or any required additional permits are obtained;

f. Obtain modifications to permits acquired by the Contractor;

g. Pay all charges, fees and taxes; and

h. Provide proof of payment of all taxes before the Department makes final payment.

The Contractor shall not work in areas that are not permitted for use by the Contract. Before working in an area not previously permitted for use by the Contract, the Contractor shall:

a. Contact all government agencies having possible or apparent permit authority over that area;

b. Obtain all required permits, clearances, and licenses from those agencies;

These permits and clearances may include, but are not limited to: APDES General Permit, State Historic Preservation Officer approval; Department of Natural Resources Coastal Consistency Determination, Title 16 Material Site Reclamation, and Temporary Water Use Permits; Department of Environmental Conservation Section 401 Certification, Solid Waste Disposal Site and Construction Camp Permits; Department of Fish and Game Special Area Permits; U.S. Fish and Wildlife Service Threatened and Endangered Species clearance; U.S. Corps of Engineers Section 404/10 Permits; city or local government development permits and flood hazard permits; and the permission of the property owner or lessee.

c. Obtain permission from any property owners or lessees with an interest in the property; and

d. Provide all of the following to the Engineer:

(1) All permits or clearances necessary to use the site for its intended purpose(s);

(2) A written statement that all permits or clearances necessary have been obtained;

(3) Written evidence that the Contractor has contacted all of the relevant agencies and that no additional permits are required on the part of the Contractor, including at a minimum the name of the agency and staff person contacted, the date contacted, and result of coordination; and

(4) A plan that identifies how the site will be finally stabilized and protected.

The Engineer may reject a proposed site if the Contractor fails to provide any of the above information or to demonstrate that a proposed site can be finally stabilized to eliminate future adverse impacts on natural resources and the environment.

70-03 PATENTED DEVICES, MATERIALS AND PROCESSES. If the Contractor employs any design, device, material, or process covered by patent, trademark, or copyright, the Contractor shall obtain and provide the Engineer with a copy of a suitable legal agreement with the patentee or owner.

The Contractor and the Surety shall defend, indemnify, and hold harmless the state and its representatives and any affected third party or political subdivision from any claim, cause of action, and damages for infringement arising from or relating to the Contractor's use of a patented design, device, material, process, trademark, or copyright.

The Contractor has no right to use for its own purposes, any of the contract documents prepared by or for the Department. The Contractor shall not use any of the contract documents on extensions of the project, or

on work authorized by the Department, without written consent of the Department. The Department's consent is conditioned upon the Contractor:

a. Agreeing to indemnify, defend, and hold the state harmless for any claims arising from the reuse of the contract documents;
b. Presenting the written consent of the designer; and
c. Presenting a certification from the designer, evidenced by application of new designer's seal, that the design is suitable for the proposed use.

70-04 WAGE RATES. The Contractor and all subcontractors shall pay the current prevailing rate of wages as per AS 36.05.010 and this Contract. On federally funded projects the Contractor and all subcontractors shall pay the higher of the appropriate wage rates published by the Alaska Department of Labor and the U.S. Department of Labor, for each individual job classification. The Contractor and all subcontractors shall file certified payroll with the Alaska Department of Labor and Workforce Development (DOLWD) and with the Engineer for all work performed on the project.

Before beginning work the Contractor shall file a Notice of Work with DOLWD and pay all required fees. After finishing work the Contractor shall file a Notice of Completion with DOLWD and pay all additional fees required by increases in the Contract amount.

70-05 FEDERAL PROVISIONS. The Contractor shall:

a. Observe all federal laws, rules, regulations and grant requirements applicable to the project; and

b. Allow appropriate federal officials access to inspect the work.

The federal government is not a party to the Contract. The Contractor agrees that federal inspections will not form the basis for any claim against the federal government or the State for interference with the rights of the Contract parties.

70-06 SANITARY, HEALTH, AND SAFETY PROVISIONS. The Contractor shall provide and maintain neat and sanitary accommodations for employees that meet all federal, state and local requirements.

The Contractor shall comply with federal, state, and local laws, rules, and regulations concerning construction safety and health standards, including U.S. Mine Safety and Health Administration rules when the project includes pit or quarry operations.

The Contractor shall not expose the public to, or require any workers to work under, conditions that are unsanitary, hazardous, or dangerous to health or safety.

The Contractor is responsible for ensuring all workers are adequately protected. The Contractor shall have a safety and health management program that complies with AKOSH requirements, and includes:

a. A worksite hazard analysis;

b. A hazard prevention and control plan including personal protective equipment and safe work procedures required for specific tasks;

c. New employee training and periodic worker training regarding safety and health;

d. Regular safety meetings with written documentation of attendance, safety topics discussed, worker safety complaints, and corrective actions taken; and

e. A designated safety officer, employed by the Contractor, who monitors the construction site and is responsible for implementing the safety and health management program.

The Contractor and Surety shall defend, indemnify and hold harmless the State of Alaska from all claims, causes of action and judgments arising from or relating to the Contractor's failure to comply with any applicable federal, state or local safety requirement, regulation or practice, whether or not listed above.

70-07 ARCHAEOLOGICAL OR HISTORICAL DISCOVERIES. When the Contractor's operation encounters prehistoric artifacts, burials, remains of dwelling sites, paleontological remains, shell heaps, land or sea mammal bones, tusks, or other items of historical significance, the Contractor shall:

a. Immediately cease operations at the site of the find;

b. Immediately notify the Engineer of the find; and

c. Not disturb or remove the finds or perform further operations at the site of the finds until directed by the Engineer.

The Engineer will issue an appropriate Change Order if the Engineer orders suspension of the Contractor's operations or orders the Contractor to perform extra work in order to protect an archaeological or historical find.

70-08 PUBLIC CONVENIENCE AND SAFETY, AND RAILWAY PROVISIONS. The Contractor shall control its operations and those of its subcontractors and all suppliers, to assure the least inconvenience to the traveling public. Under all circumstances, safety shall be the most important consideration.

The Contractor shall maintain the free and unobstructed movement of aircraft, airport personnel and vehicular traffic in the AOA, except as specifically provided in this Contract. The Contractor's operations and those of its subcontractors and all suppliers, shall be done according to subsection 40-05 and shall limit operations for the convenience and safety of the traveling public as specified in subsection 80-04.

The Contractor shall conduct all operations on or near a railroad according to the Contract, any contract between the Department and the railroad, and any permits issued by the railroad. The Department shall obtain permits for hauling materials across railroad tracks at locations specified in the Contract. If the Contractor desires additional crossings, the Contractor shall obtain any required permits at the Contractor's expense.

70-09 BARRICADES, WARNING SIGNS AND HAZARD MARKINGS. The Contractor shall furnish, erect, and maintain all barricades, warning signs and markings for hazards necessary to protect the public and the work. It shall be the Contractor's responsibility to maintain markers at all times to separate areas closed to aircraft from adjacent areas that are open to aircraft. When used during periods of darkness, such barricades, warning signs and hazard markings shall be suitably illuminated. Barricades, warning signs, and markings for hazards that are in the air operations area shall be a maximum of 18 inches high. Barricades shall be spaced not more than 25 feet apart.

For public vehicular and pedestrian traffic, the Contractor shall furnish, erect, and maintain barricades, warning signs, lights and other traffic control devices in conformity with the *Manual on Uniform Traffic Control Devices for Streets and Highways* (published by the United States Government Printing Office) and the *Alaska Traffic Manual Supplement* ~~(published by the Department)~~, and according to the Traffic Control Plan.

When the work requires closing an airport operations area of the airport or portion of such area, the Contractor shall furnish, erect and maintain temporary markings and associated lighting conforming to the requirements of AC 150/5340-1, *Standards for Airport Markings*, and according to the Construction Safety Plan.

For work within the airport property, the Contractor shall furnish, erect, and maintain markings and associated lighting of open trenches, excavations, temporary stockpiles, and parked construction equipment that may be hazardous to the operation of emergency, fire-rescue, maintenance or support vehicles on the airport in conformance to AC 150/5370-2, *Operational Safety on Airports During Construction*.

The Contractor shall identify each motorized vehicle or piece of construction equipment in conformance to AC150/5370-2.

Open-flame type lights shall not be permitted within the air operations areas of the airport.

70-10 USE OF EXPLOSIVES. The Contractor shall obey all laws, regulations and permits applicable to using, handling, loading, transporting, or storing explosives. When using explosives, the Contractor shall take utmost care not to endanger life, property, new construction, or existing portions of the project and facilities that are to remain in place after the project is complete.

The Contractor shall provide notice to property owners, the traveling public, and utility companies in the vicinity before using explosives. The Contractor shall provide a minimum of three working days notice to the Federal Aviation Administration and the airport manager. The Contractor shall notify police and fire authorities in the vicinity before transporting or using explosives. The Contractor shall provide notice sufficiently in advance to enable all potentially affected parties to take whatever steps they may deem necessary to protect themselves and their property from injury or damage. The Contractor shall not use explosives on or near airport property until a Notices to Airmen (NOTAMs) has been issued. Each new use of explosives may require a separate NOTAMs to be issued. The Contractor shall not use electric blasting caps within 1,000 feet of the airport property.

The Contractor is liable for all property damage, injury, or death resulting from the use of explosives on the project. The Contractor and Surety shall indemnify, hold harmless, and defend the State of Alaska from all claims related to the use of explosives on the project, including claims from government agencies alleging that explosives were handled, loaded, transported, used, or stored improperly.

If there exists a bald eagle nest near the material site, the Contractor shall avoid violations of the Bald eagle Protection act, as required in Subsection GCP 80-04.

70-11 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE.

a. **Property Marks.** The Contractor shall:

   (1) Be responsible for and protect from disturbance all land monuments and property marks until the Engineer has approved the witnessing or otherwise referenced their locations; and

   (2) Not move such monuments or marks without the Engineer's approval.

b. **Damage to Property.** The Contractor shall:

   (1) Be responsible for all damage to public or private property resulting from any act, omission, neglect, or misconduct in the manner or method of executing the work;

   (2) Be responsible for all damage to public or private property resulting from defective work or materials at any time, before, during, or after project completion; and

   (3) Restore all such damaged property to a condition similar or equal to that existing before the damage occurred, at no additional cost to the Department.

c. **Protection of Natural Resources.** The Contractor shall:

   (1) Conduct work in a manner that minimizes disturbance to and protects natural resources in compliance with all federal, state, and local laws and regulations;

   (2) When working near designated wetlands, as defined by the Corps of Engineers, place no fill, nor operate equipment outside the permitted area;

(3) When working in or near designated anadromous fish streams, as defined by AS 41.14.840 and AS 41.14.870, place no fill or dredge material, nor operate equipment, within or on the banks of the stream (including fording) except as permitted by the State Fish Habitat Permit issued for the project; and

(4) Not refuel and service equipment within 100 feet of wetlands and/or other water bodies.

d. **Hazardous Materials.** Hazardous materials include but are not limited to petroleum products, oils, solvents, paints, lead based paints, asbestos, and chemicals that are toxic, corrosive, explosive, or flammable. Except as otherwise specified in this Contract, the Contractor shall:

(1) Not excavate, nor use for fill, any material at any site suspected of or found to contain hazardous materials or petroleum fuels;

(2) Not raze and remove, or dispose of structures that contain asbestos or lead-based paints;

(3) Not stockpile, nor dispose of, any material at any site suspected of or found to contain hazardous materials or petroleum;

(4) Report immediately to the Engineer any known or suspected hazardous material discovered, exposed, or released into the air, ground, or water during construction of the project;

(5) Report any containment, cleanup, or restoration activities anticipated or performed as a result of such release or discovery;

(6) Handle and dispose of hazardous material with properly trained and licensed personnel who follow an approved Hazardous Material Control Plan as per Section P-157. Dispose of hazardous material according to federal, state and local laws and regulation.

(7) Store, handle and dispose of hazardous material that the Contractor or subcontractors brought to or used on the project, at no additional cost to the Department.

If petroleum contaminated soils are found within the existing SREB, the Contractor shall follow ADEC 18AAC 75 Oil and Hazardous Substances Pollution Control Regulations. The Contractor shall develop and implement a cleanup and disposal plan approved by ADEC.

e. **Protected Areas.** The Contractor shall not use land from any park, recreation area, wildlife or waterfowl refuge, or any historical site located inside or outside of the project limits for excess fill disposal, staging activities, equipment or material storage, or for any other purposes unless permitted by the Contract or unless all permits and clearances necessary for such work have been obtained by the Contractor as detailed in Subsection 70-02.

f. **Solid Waste.** The Contractor shall remove all debris, trash, and other solid waste from the project site as soon as possible and according to the Alaska Department of Environmental Conservation Solid Waste Program.

g. **Restoring Areas.** Areas used by the Contractor, including haul routes, shall be restored to their original condition after the Contractor's operations are completed. The original condition of an area shall be determined as follows: Prior to commencement of operations, the Engineer and the Contractor shall inspect each area and haul route that will be used by the Contractor and take photographs to document their condition. After construction operations are completed, the condition of each area and haul route will be compared to the earlier photographs. Prior to demobilization the Contractor shall repair damages attributed to its operations. The Contractor agrees that all costs associated with repairs shall be subsidiary to other items of work and will not be paid for directly.

h. **Material Disposal Sites.** Offsite disposal areas may be at locations of the Contractor's choice, provided the Contractor obtains from the owner of such land written permission for such dumping and a waiver of all claims against the State for any damage to such land which may result therefrom, together with all permits required by law for such dumping. A copy of such permission, waiver of claims, and permits shall be filed with the Engineer before commencing work on private property. The Contractor's selected disposal sites shall also be inspected and approved by the Engineer prior to use of the sites.

70-12 FOREST PROTECTION. The Contractor shall:

a. Comply with all laws and regulations of the United States and the State of Alaska, local governments, or other authorities governing the protection of forests and the carrying out of work within forests;

b. Keep forest areas in an orderly condition;

c. Dispose of all refuse and obtain permits for the construction and maintenance of all construction camps, stores, warehouses, residences, latrines, cesspools, septic tanks, and other structures according to the requirements of the supervising authorities;

d. Take all reasonable precautions to prevent and suppress forest fires;

e. Require workers and subcontractors, both independently and at the request of officials, to do all reasonably within their power to prevent and suppress and to assist in preventing and suppressing forest fires; and

f. Make every possible effort to notify the appropriate forestry agency at the earliest moment of the location and extent of any forest fire.

70-13 RESPONSIBILITY FOR DAMAGE CLAIMS. The Contractor shall indemnify, hold harmless, and defend the State of Alaska and its agents and employees from any and all claims or actions for injuries or damages whatsoever sustained by any person or property that arise from or relate to, directly or indirectly, the Contractor's performance of the Contract; however, this provision has no effect if, but only if, the sole proximate cause of the injury or damage is the Department's negligence.

This Contract does not create a third party benefit to the public or any member of the public, nor does it authorize any person or entity not a party to this Contract to maintain a suit based on this Contract or any term or provision of the Contract, whether for personal injuries, property damage, or any other claim or cause of action.

70-14 OPENING SECTIONS OF THE PROJECT TO TRAFFIC. The Engineer may, at their discretion, order the Contractor to open sections of the work to traffic prior to completion of the entire project. Openings under this section shall not constitute (a) acceptance of the opened sections or any other part of the work or (b) a waiver of any other provision of the Contract.

The Engineer may establish a time period for completing any features of the opened section of work that are behind schedule.

The Contractor shall:

a. Maintain the opened portions of the work without additional compensation;

b. Perform all necessary repairs or renewals on the opened sections of the work without additional compensation;

c. Conduct the remainder of the work with minimum interference to traffic; and

d. Maintain barricades and other safety devices required by AC 150/5370-2, *Occupational Safety on Airports During Construction*, to provide separation of opened and closed sections of the project.

70-15 CONTRACTOR'S RESPONSIBILITY FOR WORK. The Contractor shall be responsible for implementing all preventative measures necessary to protect, prevent damage, and repair damage to the work from all causes at no additional cost to the Department. This duty continues from the date construction begins until the date specified in a letter of Substantial Completion or Partial Acceptance of a specific section of the project. Where there is a Partial Acceptance, the duty ends only as to the accepted portion of the work. This duty continues during periods of suspended work, except in specific sections the Department has agreed to maintain under Subsection 50-13.a. Seasonal Suspension of Work.

The Contractor shall not load or permit the loading with materials, equipment or workers of a floor, roof, or wall of a building included in the work in a manner that will endanger the structure, workers, or adjacent property. The Contractor shall brace the building during construction to allow it to withstand reasonably foreseeable winds, snow and ice, and earthquakes.

The Contractor shall rebuild, repair, restore, and make good all losses or damages to any portion of the work including that caused by vandalism, theft, accommodation of public traffic, and weather. The Department will only be responsible for loss or damage due to unforeseeable causes beyond the control of and without the Contractor's fault or negligence, such as Acts of God, the public enemy, and governmental authorities.

In case of suspension of work from any cause, the Contractor shall take such precautions as may be necessary to prevent damage to the work or facilities affected by the work. This will include providing for drainage and erecting any necessary temporary structures, signs, or other facilities and maintaining all living material such as plantings, seedings, and soddings.

70-16 RESERVED.

70-17 FURNISHING RIGHT-OF-WAY. The Department will secure all necessary right-of-way or property in advance of construction. Any exceptions will be indicated in the Contract.

70-18 PERSONAL LIABILITY OF PUBLIC OFFICIALS. There shall be no liability upon the Engineer and their authorized representatives, either personally or as officials of the state, in carrying out any of the provisions of this Contract, or in exercising any power or authority granted to them by or within the scope of the Contract, it being understood that in all such matters the Engineer and their authorized representatives act solely as agents and representatives of the State. The Contractor shall bring no suit related to or arising under this Contract naming as defendants any State officer, employee or representative in either their personal or official capacities, and shall include a prohibition to that effect in all subcontracts entered into for this Project.

70-19 NO WAIVER OF LEGAL RIGHTS. The Department shall not be precluded nor estopped by any measurement, estimate, or certificate made either before or after the completion and acceptance of the work and payment, from showing the true amount and character of the work performed and materials furnished by the Contractor, nor from showing that any measurement, estimate, or certificate is untrue or is incorrectly made, nor that the work or materials do not in fact conform to the Contract.

The Department shall not be precluded nor estopped, notwithstanding any measurement, estimate, or certificate and payment, from recovering from the Contractor or the Contractor's Sureties, or both, such damages as it may sustain by reason of the Contractor's failure to comply with the terms of the Contract.

Neither the acceptance by the Department, or by any representative of the Department, nor any payment for or acceptance of the whole or any part of the work, nor any extension of time, nor any possession taken by the Department, shall operate as a waiver by the Department of any portion of the Contract or of any right of the Department to damages. A waiver by the Department of any breach of the Contract shall not be held to be a waiver of any other subsequent breach.

70-20 GRATUITY AND CONFLICT OF INTEREST. The Contractor shall not extend any loan, gratuity, or gift of money of any form whatsoever to any employee of the Department, nor will the Contractor rent or purchase any equipment or materials from any employee of the Department or to the best of the Contractor's knowledge from any agent of any employee of the Department. The Contractor shall execute and furnish the Department an affidavit certifying that the Contractor has complied with this section before final acceptance.

SECTION 80

PROSECUTION AND PROGRESS

80-01 SUBLETTING OF CONTRACT. The Contractor shall submit a Contractor Self Certification for Subcontractors and Lower Tier Subcontractors, Form 25D-042, before the Contractor or any subcontractor sublets, 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 sublet 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 subletting, 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. **Submittals.** The Contractor shall ensure ~~that for all~~ the following for each subcontract~~s~~ (agreement~~s~~):

   (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, as well as other items listed in Form 25D-042 are included in the subcontracts;

   (4) The subcontractors pay current prevailing rate of wages as per Subsection 70-04 Wage Rates and file certified payrolls with the Engineer and DOLWD for all work performed on the project~~;~~ ~~and~~

   (5) Upon receipt of a request for more information regarding subcontracts, the requested information is provided to the Department within 5 calendar days~~;~~.

   (6) The Department is furnished with two copies of the subcontract signed by both parties and including item descriptions and prices of subcontracted work before the subcontracted work begins.

b. **Work that is Subcontracting.** The following will be considered as subcontracting, unless performed by the Contractor:

   (1) Roadside or Onsite Production. Roadside or onsite 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.

c. **Work that is not Subcontracting.** 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.

(2) **Hauling.** Delivery of materials from a commercial plant to a different commercial plant, and delivery from a commercial plant to the project site by vehicles owned and operated by the commercial plants or by commercial freight companies that have a contract with the commercial plant. Commercial freight companies are trucking or hauling companies that deliver multiple types of materials to multiple clients, both public and private, on an established route and on a recurrent basis.

(3) **Contractors' General Business.** Work within permanent home offices, branch plants, fabrication plants, tool yards, and other establishments that are part of a contractor's or subcontractor's general business operations.

d. **Owner-Operators.** Hauling of materials for the project by bona fide truck owner-operators who are listed as such on the certified payroll of the Contractor or approved subcontractor is not considered subcontracting for purposes of AS 36.30.115.

The Contractor shall ensure that the required prompt payment provisions of AS 36.90.210 are included in contracts with owner-operators.

The Contractor shall collect and maintain at the project site current and valid copies of the following to prove that each trucker listed is a bona fide owner-operator:

(1) Alaska Driver's License with appropriate CDL class and endorsements;

(2) Business license for trucking with supporting documents that list the driver as the business owner or corporate officer;

(3) Documents showing the driver's ownership interest in the truck, including copies of:

(a) Truck registration; and

(b) Lease (if truck is not registered in driver's name or in the name of the driver's company).

The Contractor shall maintain legible copies of these records for a period of at least three years after final acceptance of the project.

Owner-operators must qualify as independent contractors under the current Alaska Department of Labor's criteria. Owner-operators may be required to show:

(1) The owner-operator's right to control the manner in which the work is to be performed;

(2) The owner-operator's opportunity for profit or loss depending upon their managerial skill;

(3) The owner-operator's investment in equipment or materials required for their task, or the employment of helpers;

(4) Whether the service rendered requires a special skill;

(5) The degree of permanence of the working relationship; and

(6) Whether the service rendered is an integral part of the owner-operator's business.

The status of owner-operators is subject to evaluation throughout the project period. If the criteria for an independent contractor are not met, the Contractor shall submit amended payrolls listing the driver as an employee subject to all labor provisions of the Contract.

The Contractor shall issue each owner-operator a placard in a form approved by the Engineer that identifies both the truck driver and the vehicle. The placard shall be prominently displayed on the vehicle so that it is visible to scale operators and inspectors.

Not withstanding 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 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 Contractor shall submit the following documents to the Engineer at least five working days before the preconstruction conference:

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 GCP-50-02 and GCP-60-08, and for other events such as inspection of structural steel fabrication.

c. A list showing all proposed subcontractors and material suppliers.

d. A Submittal Register, according to Subsection GCP-60-08.

e. A Construction Phasing plan, when required under Section G-300.

f. 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 Section P-157.

g. A letter designating the Contractor's Project Superintendent, defining that person's responsibility and authority, and providing a specimen signature.

h. A letter designating an Equal Employment Opportunity Officer and a Disadvantaged Business Enterprise Officer, and designating those person's responsibilities and authority.

i. A Quality Control Plan, as required under Sections GCP-60-03 and GCP- 100

j. A letter designating a Safety Officer for workers, and designating that person's responsibilities and authority.

k. A Traffic Control Plan, as required under Subsection GCP-70-09 and Section G-710.

l. A Utility Repair Plan, as required under Subsection GCP-50-06.e.

m. A Schedule of Values submitted on a state contract form for any building included in the work. The Contractor may not begin construction of the building until the Engineer has approved the Schedule of Values. The Contractor shall break down all the work for the building into measurable work items, in sufficient detail to serve as a basis for progress payments. Any stockpiled materials for which interim payment is proposed shall be included. The Schedule of Values must indicate a quantity and unit cost, including overhead and profit for each work item, the total cost for each work item, and the total cost of all work items. The Contractor shall certify the cost of each item and the overhead and profit for each item. The total cost for all work items must equal the total contract price for the building.

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.

For any building included in the work, the Contractor shall maintain one record copy of all plans, drawings, specifications, addenda, directives, change orders, supplemental agreements and written interpretations and clarifications issued by the Engineer, annotated to accurately record variations in the work from requirements shown or indicated in the contract documents. These record documents together with all approved samples and a copy of all approved working drawings will be available to the Engineer for reference and copying. Upon completion of the work, the Contractor shall deliver the annotated record documents, samples, and working drawings to the Contracting Officer.

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.

   To prevent impacts to migratory birds, the following construction activities are prohibited between April 15 and July 15:

   (1) Clearing of vegetation.
   (2) Fill placement over vegetated areas.
   (3) Excavation of vegetated areas.
   (4) Other construction activities that cause disturbance of vegetation.

   The prohibited activities specified in (1) through (4) above do not apply if the vegetated areas have been sufficiently disturbed or altered (e.g. by grubbing, excavation, fill placement or use of plastic or other materials that will cover the nesting habitat) prior to April 15 to eliminate the nesting habitat.

b. **Construction Safety Plan (CSP).** A CSP is included within the contract documents when attached as Appendix D. The CSP specifies minimum requirements for operational safety during construction activities. The Contactor shall conduct operations according to the CSP and the provisions set forth within the current version of AC 150/5370-2, *Operational Safety on Airports During Construction*. No deviations or modifications may be made to the approved CSP unless approved in writing by the Engineer.

   The Contractor shall implement all necessary CSP 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 CSP 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 CSP, and that the subcontractors and suppliers implement and maintain all necessary safety measures.

The CSP 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 Contactor'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 with Airport Management, the FAA Flight Service Station, and the Engineer. The Contractor shall provide written notice to the Airport Management, FAA, and the Engineer, at least 45 days before working in the Air Operations Area. The Contractor shall copy to the Engineer all correspondence with Airport Management and FAA.

The Contractor shall prepare a NOTAMs on a form provided by the Department, and submit the form through the Engineer to the Airport Management 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 close an Air Operations Area until a NOTAMs has been issued by Airport Management or by FAA, until the Engineer has authorized the Contractor to work there, and until the necessary temporary marking and associated lighting is in place as provided in Subsection 70-09.

For questions, the primary FAA contact is the FAA Systems Operations Control Center at (800) 478-2139. As an alternate contact if ~~I~~f the primary contact is unavailable, contact the Chairman of Long Term Outage Committee, Operations Engineering Section, FAA Airways Facilities Division at (907) 271-5800~~5552~~.

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:**

(a) **With a Flight Service Station:** When the airport has an operating FSS, 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 *Common Traffic Advisory Frequency* (CTAF) published in the current *Alaska Flight Information Supplement.* The Contractor shall furnish a liaison radio operator and 2-way radio communication with each work party located within the Air Operations Area.

(b) **Without a Flight Service Station:** At those airports without an operating FSS, 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 *Common Traffic Advisory Frequency* (CTAF) published in the current *Alaska Flight Information Supplement.* The Contractor shall furnish 2-way radio communication with each work party located within the Air Operations Area and arrange for all communication with aircraft through one liaison radio operator.

The Contractor is advised that a portion of the project is located on an active airport. It shall be the responsibility of the Contractor to coordinate all his construction and haul activities with the Project Engineer and to comply with the Project Engineer's instructions concerning the movements of construction equipment, men and materials in the vicinity of the active airport.

Contact information for the assigned project engineer will be established at the preconstruction conference.

1. Staging Area

The Contractor may use the staging area as designated on the plans. No utilities are available at this site. The Contractor shall obtain landowner permission prior to using any other staging areas.

2. Haul Routes

The Contractor shall confine his equipment to designated haul routes and work areas shown on the plans. Alternate haul routes must be approved by the Engineer prior to use.

The Contractor shall be responsible for the maintenance of all routes being utilized for hauling purposes in the construction of this project. Road conditions shall be returned to their prior conditions upon completing the work. The Contractor shall provide water or other dust palliative and appropriate distribution equipment as required for dust control on his haul roads and in his work area. Prior to beginning hauling operations, the Contractor, a representative of the Village Council and the Engineer will make a joint inspection of the proposed haul routes to determine the condition of the existing routes. The Contractor shall video tape the haul routes at this time to document the condition

of the routes. This inspection and the video will be the basis for establishing the condition of the haul route.

At the conclusion of hauling operations, a post-construction road inspection by the Contractor, a representative from the Village Council and the Engineer shall be accomplished. The Contractor shall, at a minimum, restore the haul roads to the pre-hauling condition. All potholes, ruts, and drainage problems that develop during the course of construction shall be graded and backfilled with aggregate surface course at Contractor's expense.

All costs for haul road maintenance, upgrading, construction, removal and restoration during and after construction shall be subsidiary to the contract and no separate payment will be made.

3. Barge Landing

The Contractor shall obtain approval from the City of Ouzinkie before using the barge landing facility in the community. The Contractor shall be responsible for investigating the navigation and access requirements for delivery of equipment and materials for the community barge landing. The Contractor shall be responsible for investigating and preparing the landing site and haul routes for the loading and unloading of equipment and materials.

Should the barge landing need stabilization below ordinary high water (vegetation line), or the Contractor desires to use an alternate barge landing, the Contractor will be required to obtain the necessary authorization. The authorization is not limited to the following, but may include a Corps of Engineers Section 404 Permit, Alaska Department of Fish and Game Title 16 Permit, Alaska Department of Natural Resources Land Use Permit, and a Consistency Determination from the Alaska Coastal Management Program administered by the Division of Governmental Coordination.

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 construction safety plan requirements, violate security plan requirements, perform the work in an unskilled manner, who are intemperate or disorderly, or who jeopardize the safety of the public, other workers or Engineer's personnel. 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 or by specific Completion Date.

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 Items c.(1) through c.(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 unsafe conditions for the workers or the public;

(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 on a basis commensurate with the amount and difficulty of the extra work, provided that the extra work is for a controlling item.

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; and

(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.

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	$ 100,000	$ 300
100,000	500,000	550
500,000	1,000,000	750
1,000,000	2,000,000	1,000
2,000,000	5,000,000	1,500
5,000,000	10,000,000	2,500
10,000,000	---------	3,000

Permitting the Contractor to continue work 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 to 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:

(a) Applied to reduce any payments to be made by the Department under the Contract;
(b) Credited to the cost of the work; or
(c) 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.

(b) Payments approved by the Contracting Officer under 80-09.b.(4)(b) to settle the termination claims of suppliers and subcontractors to the extent not covered under 80-09.c.(1)(a).

(c) Reasonably incurred costs for:

1. Accounting, legal, clerical, and other costs reasonably necessary for preparation of the termination claim and settlement negotiations, excluding costs incurred after the date an appeal is filed with the Appeals Officer under 80-09.h.

2. Settling subcontractor and supplier claims, excluding the amounts of those settlements paid under 80-09.c.(1)(b).

(d) Reasonable profit on the costs included in Subsection 80-09.c.(1)(a) based on the Contractor's bid rate for profit or as determined under any other reasonable accounting method. However, if it appears that the Contractor would have sustained a loss on the entire Contract had it been completed, the Contracting Officer will allow no profit and will reduce the settlement to reflect the indicated rate of loss under Subsection 80-09.d. The Department will not pay profit on costs included in Subsections 80-09.c.(1)(b) and 80-09.c.(1)(c).

(2) Equipment claims will be reimbursed as follows:

(a) Contractor-owned equipment usage, based on the Contractor's ownership and operating costs for each piece of equipment as determined from the Contractor's accounting records. Do not base equipment claims on published rental rates.

(b) Idle time for Contractor-owned equipment, based on the Contractor's internal ownership and depreciation costs. Idle equipment time is limited to the actual period of time equipment is idle as a direct result of the termination, not to exceed 30 days. Operating expenses will not be included for payment of idle equipment time.

(c) Rented equipment, based on reasonable, actual rental costs. Equipment leased under "capital leases" as defined in Financial Accounting Standard No. 13 will be considered Contractor-owned equipment. Equipment leased from an affiliate, division, subsidiary or other organization under common control with the Contractor will be considered Contractor-owned equipment, unless the affiliate, division, subsidiary or other organization has an established practice of leasing to unaffiliated lessees.

(3) The following costs are not payable under a termination settlement agreement or Contracting Officer's determination of the termination claim, or on appeal:

(a) Loss of anticipated profits or consequential or compensatory damages.

(b) Unabsorbed home office overhead (also termed "General & Administrative Expense") related to ongoing business operations.

(c) Bidding and project investigative costs.

(d) Direct costs of repairing equipment to render it operable for use on the terminated work.

d. Adjustment for Loss. If the Contractor would have sustained a loss on the entire Contract had it been completed, the Department will not pay the Contractor more than the total of:

(1) The amount due for termination claim costs under Subsection 80-09.c.(1)(c); plus

(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 disposal 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.

l. **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.

SECTION 90

MEASUREMENT AND PAYMENT

90-01 GENERAL. Wherever the Contract provides that certain work is subsidiary or it is without extra compensation, the payment for that work is included in the payment for other items of work, and no further or additional payment shall be made for that work.

When more than one type of material or work is specified for a pay item, letter or numeric suffixes included within parentheses following the pay item number are used to differentiate the types.

Lump sum items will not be measured for payment. The Contractor shall accept the bid amount for a lump sum item as complete payment for all work necessary to complete that item. Quantities shown for lump sum items are approximate. No adjustment in the lump sum price will be made if the quantity furnished is more or less than the estimated quantity unless the Contract specifically states otherwise.

For work within the building boundary line and above the bottom of the footing, unless specifically identified as an exception under specification section S-142, the work shall be measured and paid according to the schedule of values submitted under subsection 80-03. For work outside the building boundary or below the bottom of the footing, the work shall be measured and paid according to the contract unit prices for the work involved.

90-02 MEASUREMENT OF QUANTITIES. All work completed under the Contract will be measured using the U.S. Customary system of measure. The Engineer may agree for purposes of making progress payments to use a method of measurement other than the methods described below. However, all final payments for quantities will be calculated using one or more of the methods of measurement described below and in the applicable pay item section. Unless otherwise specified, work will be measured as follows:

a. **Acre (43,560 ft^2).** Horizontally, unless specified on the ground surface. No deductions will be made for individual fixtures with an area of 500 ft^2 or less.

b. **Contingent Sum.** Measured as specified in the Contract or Directive authorizing the work. The method of payment may include: (1) a lump sum basis, (2) a price multiplied by the units of work performed, (3) a pay adjustment based on the quality of work, or (4) a deduction from the contract amount.

c. **Cubic Yard (yd^3).** At the location specified using one of the following methods:

   (1) **Average End Area.** End area is the calculated area between original ground cross section and either the design cross section or at the Engineer's discretion the final cross section. Volume of material is calculated using the average of end areas multiplied by the distance along centerline between end areas. In extreme cases where most of the earthwork lies along a single horizontal curve the Engineer may compute volume using the average of end areas multiplied by the distance along centroid of cross section between end areas.

   (2) **Three-Dimensional.** Where it is impractical to measure material by cross sectioning due to erratic location of isolated deposits, acceptable methods involving three-dimensional measurements may be used.

   (3) **Neat Line.** Structures will be measured according to neat lines shown on the Plans or as altered to fit field conditions.

   (4) **Nominal.** Volume calculated as nominal width times nominal thickness times the average length of each piece.

(5) **Weight.** With the Engineer's written approval, material that is specified to be measured by volume may be weighed and converted to volume for payment purposes. The Engineer will determine the appropriate conversion factors. When liquid asphalt is a pay item, ASTM D 4311 will be used to convert from weight to volume at 60 °F.

d. **Cubic Yard Vehicle Measure (CYVM).** Material measured by volume in the hauling vehicle will be measured at the point of delivery. Vehicles may be of any acceptable size or type provided that the volume of the actual contents may be readily and accurately determined. Vehicles shall be loaded to the measured vehicle volume. If vehicles are not loaded to the measured vehicle volume, the Engineer at their discretion, may apply a percentage of full factor to the measured volume. Loads shall be leveled when directed. No payment will be made for loads that exceed the legal capacity of the vehicle.

e. **Linear Foot (LF).** From end to end, in place, parallel to the centerline of the item or ground surface on which the items are placed.

f. **Thousand Feet Board Measure (MBM).** Nominal volume based on nominal widths and thickness times actual extreme length of each piece. One board foot = 1 ft^2 X 1 inch thick.

g. **Thousand Gallon (MGal).** By one of the following methods:

(1) Measured or calibrated volume tank;

(2) Metered volume, using a certified calibrated meter; or

(3) Weighed under this subsection and converted to volume, using a specified or approved conversion factor.

h. **Mile.** From end to end, measured horizontally along centerline.

i. **Pound.** Using a certified scale or the net weight of packaged material as labeled by the manufacturer. The Engineer will accept nominal weights for standard manufactured items, unless otherwise specified. The Engineer will accept industry-established manufacturing tolerances, unless otherwise specified.

j. **Square Foot (ft^2).** Parallel to the surface being measured. No deductions will be made for individual fixtures with an area of 1 ft^2 or less. Transverse measurement for area computations will be the neat dimensions shown on the Plans or as directed by the Engineer.

k. **Square Yard (yd^2).** Parallel to the surface being measured. No deductions will be made for individual fixtures with an area of 1 yd^2 or less. Transverse measurement for area computations will be the neat dimensions shown on the Plans or as directed by the Engineer.

l. **Station (100 feet).** Horizontally, parallel to centerline.

m. **Ton (2,000 pounds).** By one of the following methods:

(1) **Commercial Weighing System.** Permanently installed and certified commercial scale that meets the requirements for the project weighing system.

(2) **Project weighing system.** As specified under Subsection G-130.

(3) **Invoices.** If bulk material is shipped by truck or rail and is not passed through a mixing plant, furnish a supplier's invoice with net weight or volume converted to weight. Periodic check weighing may be required.

Trucks used to haul material being paid for by weight shall be weighed empty at least once daily and at such times as directed. Each truck shall bear a plainly legible identification mark.

Due to possible variations in the specific gravity of the aggregates, the measured weight may vary from the weight used to estimate bid quantity, and no adjustment in contract unit price will be made because of such variation.

If material is shipped by rail, the certified car weight may be accepted provided that only the actual weight of material is paid for. Car weights will not be acceptable for material to be passed through mixing plants.

Net certified scale weights or weights based on certified volumes in the case of rail shipments may be used as a basis of measurement, subject to correction when material has been lost, wasted, or otherwise not incorporated into the work.

When materials are shipped by truck or transport, net certified weights or volume, subject to correction for loss or foaming, may be used for computing quantities, in the Engineers discretion.

All aggregate paid by weight shall be less than 2% over optimum moisture.

(4) Barge Displacement Method. When the barge displacement method is proposed the Contractor shall furnish water loading charts, certified by a Professional Engineer for all barges utilized in the hauling of the material. If barge hauled material is stockpiled, loss shall be estimated by the Engineer and shall be deducted from the total weight measured to allow for stockpile loss. Any material wasted or lost between the barge and the point where it is placed in final position shall be estimated and the loss deducted by the Engineer.

When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.

90-03 SCOPE OF PAYMENT. The Department will make payment at the Contract price or prices for each item shown on the bid schedule or as modified by change order with specified price adjustments. The Contractor shall accept the Contract prices as full and complete payment for (a) furnishing all equipment, materials, tools, and labor necessary to complete the work in a complete and acceptable manner, and for (b) all of the Contractor's risk, loss, damage, or expense of whatever character arising from or relating to the work and performance of the work.

90-04 COMPENSATION FOR ALTERED QUANTITIES. Payment to the Contractor for unit price items shall be made only for the actual quantities of work performed and accepted or materials furnished, in conformance with the Contract. When the accepted quantities of work or materials vary from the quantities stated in the bid schedule, the Contractor shall accept payment at the original Contract unit prices for the quantities of work and materials furnished, completed and accepted as payment in full. Payment at the Contract unit price shall compensate the Contractor for all costs, expenses, and profit that the Contractor is entitled to receive for the altered quantities, except as provided below:

a. When the final quantity of a Major Contract Item varies more than 25 percent above or below the bid quantity, either party to the Contract may receive an equitable adjustment in the Contract unit price of that item. If the final quantity of work is:

(1) Greater than 125 percent of the bid quantity, the equitable adjustment will be made only for those units that are in excess of 125 percent of the bid quantity.

(2) Less than 75 percent of the bid quantity, the equitable adjustment will be made for those units of work done and accepted, except that the total payment for the item shall not exceed 75 percent of the total amount bid for the item.

Except as provided above and in Subsection 40-02, no allowance shall be made for any increased expenses, loss of expected reimbursement, or loss of anticipated profits suffered or claimed, either directly from alterations in quantities or indirectly from unbalanced allocations among the contract items on the part of the bidder and subsequent loss of expected reimbursements, or any other causes.

90-05 COMPENSATION FOR EXTRA WORK ON TIME AND MATERIALS BASIS. When the Engineer orders extra work to be performed on a time and materials basis, compensation will be computed as follows:

a. **Labor.** Based on the sum of **(1)** through **(6)**:

(1) **Total hours worked times the straight time rate of pay.** The rates of pay are those indicated on the certified payroll for all labor and foremen in direct charge of the specific operations. Rates shall not exceed those for comparable labor currently employed on the project, and shall not include general superintendence.

(2) **Overtime hours worked times the difference between the overtime rate and the straight time rate.** No markup is allowed.

(3) **Fringe benefit rate times the total hours worked.** Fringe benefits include Health and Welfare, Pension Fund, etc., when such amounts are required by collective bargaining agreement or other employment contracts generally applicable to the classes of labor employed on the project.

(4) **Workers' Compensation Insurance at 8 percent of (1).** The actual net rate may be used if it exceeds 10 percent and if proof of rates is furnished within 30 days of the completion of the extra work.

(5) **Either subsistence and travel allowances or prorated camp costs.** If an employee is due and receives subsistence or camp privileges on their days off, divide that cost by the number of days worked that week and add to their daily subsistence entitlement. If the employee did not work an entire day on time and materials work, prorate the entitlement for the hours worked on time and materials.

(6) **Markup at 35 percent of the sum of (1), (3), (4), and (5).** This includes and shall fully compensate the Contractor for all overhead and profit, including general superintendence, additional bond, property damage liability insurance, unemployment insurance contributions, social security and other taxes, administrative overhead costs, and profit.

b. **Materials.** Actual invoiced material and delivery costs plus 15 percent markup. The material must be approved and incorporated into the work. The Contractor shall furnish to the Engineer proof of payment for materials used in the work plus applicable transportation charges. For Contractor-produced materials, certify in writing the Contractor's actual direct costs, the quantities used, and attach cost spreadsheets and production documentation to verify the costs.

c. **Equipment.** Includes machinery and special equipment (other than small tools) necessary for the work and authorized by the Engineer. No additional compensation will be made for overhead, profit, maintenance, service, repairs, fuels, lubricants, or replacement parts.

(1) **Hourly Rental Rate.** Based on rental rates in the current edition and appropriate volume of the *Rental Rate Blue Book for Construction Equipment*, published by PRIMEDIA Information, Inc., 1735 Technology Drive, Suite 410, San Jose, CA 95110-1313.

The regular hourly rental rate is equal to the equipment rate plus the estimated hourly operating cost. These rates apply for equipment used during the Contractor's regular shift of 10 hours per day. No markup is allowed.

The equipment rate is equal to the age adjusted monthly rate for the basic equipment plus the age adjusted monthly rate for applicable attachments, both divided by 176, and multiplied by the regional adjustment factor. The equipment rate is per hour.

The age adjusted monthly rate is that resulting from application of the age adjustment formula, to eliminate replacement cost allowances in machine depreciation and contingency cost allowances.

Only the attachments required for the time and materials work will be included.

(2) **Hourly Overtime Rate.** Half of the equipment rate plus the full estimated hourly operating cost. The overtime rate will apply to hours the equipment is used in excess of 10 hours per day, either on the Contractor's normal work or on time and materials, and either on single or multiple shifts. No markup is allowed.

(3) **Hourly Stand-by Rate.** Half of the equipment rate, for equipment ordered on stand-by during the Contractor's normal work shift, not to exceed eight hours per day. No operating costs or markup is allowed.

(4) **Unlisted Equipment.** For equipment not listed in The Blue Book, the Contractor and the Engineer may agree to a rate before extra work is begun. If agreement is not reached, the Engineer has authority to establish a rate based on similar equipment in the Blue Book or prevailing commercial rates. No markup is allowed.

(5) **Leased or Rented Equipment.** Equipment that must be rented or leased specifically for work required under this section and authorized in writing by the Engineer shall be paid at invoice price plus 15 percent markup.

Equipment rented or leased for other work under the Contract and used for work under this section shall be paid based on c.(1), (2), and (3). (above) with no markup, except that the adjusted monthly rate is the monthly rate determined directly from the submitted rental or lease agreement.

(6) **Transportation of Equipment.** The actual cost of moving equipment to and from the work site. To receive reimbursement for transportation of equipment, the Contractor shall obtain the equipment from the nearest approved source and use the equipment exclusively for time and materials work. Payment for move-out will not exceed the amount of the move-in. No markup is allowed, except on operator's wages.

Basis of payment:

(a) If by common carrier: paid freight bill or invoice.

(b) If hauled with the Contractor's own resources: hourly rental rate for hauling unit plus operator wages.

(c) If equipment must be moved under its own power: half of the normal hourly rental rate plus operator's wages.

d. Work by a Subcontractor or Owner-Operator. For time and materials work performed by an approved subcontractor or owner-operator under items **a.** through **c.** above, the Contractor will

receive a 5 percent markup for administrative costs. No percentage will be paid on work covered under bid items in the original Contract. No percentage over the amount covered above will be paid for work done by a lower tier subcontractor.

e. **Work by a Specialty Subcontractor.** The Contractor shall obtain the Engineer's advance agreement that the specialty item needed is beyond the Contractor's ability or expertise or that of the Contractor's other subcontractors. For work on a specialty item performed by an approved specialty subcontractor, the Contractor will receive the approved invoice cost of work or service plus a 15 percent markup for administrative costs.

f. **Records.** The Engineer will maintain a daily record of labor, equipment and materials utilized in the extra work. The Engineer will present this record to the Contractor at the end of each day's work for verification and signature.

g. **Compensation.** Payment for time and materials work will be made in the progress estimate following receipt of the verified daily records and all required supporting information from the Contractor. If, at any time, a unit price or lump sum basis of compensation is agreed to for work being performed under this subsection, that compensation will be set forth in writing as a Change Order.

90-06 PROGRESS PAYMENTS. The Department will make monthly progress payments to the Contractor based on estimates of the value of work performed and materials on hand under Subsection 90-07. At the Department's discretion, a progress payment may be made twice monthly if the value of the estimate exceeds $10,000.

If satisfactory progress is being made, the Engineer will authorize 100 percent payment for the estimated value of work accomplished, less any authorized deductions.

If the Engineer finds that satisfactory progress is not being made, the Engineer may withhold up to 10 percent of the total amount earned as retainage from subsequent progress payments. The Engineer may withhold up to 200 percent of the estimated cost to complete final punch list items as retainage until those items are complete. The Engineer will notify the Contractor in writing within eight working days of a request for a progress payment of the reasons why part or all of the payment is being withheld as retainage and what actions may be taken by the Contractor to receive full payment.

Payments of withheld amounts will be made according to AS 36.90.200. No interest will be paid on amounts withheld as retainage.

90-07 PAYMENT FOR MATERIAL ON HAND.

a. **Partial Payment.** The Engineer will make partial payment for materials designated for incorporation into the work. The material shall:

   (1) Meet Contract requirements;

   (2) Be delivered and stockpiled at the project or other approved location;

   (3) Be supported by invoices, freight bills, and other required information; and

   (4) Not be living or perishable.

b. **Payment Requests.** The Contractor shall make each payment request in writing and:

   (1) List stockpiled items, quantities of each, and stockpile location(s);

   (2) Certify that materials meet the applicable Contract specifications;

(3) For purchased materials, attach copies of invoices, freight bills, and manufacturer's published storage recommendations;

(4) For Contractor-produced materials, attach production statements showing quantities and dates produced and copies of process quality control test results; and

(5) Include other information requested by the Engineer.

c. **Storage Conditions.** The Contractor shall protect material from damage or loss while in storage. The Contractor shall:

(1) Physically separate stockpiled materials from other materials at the storage location;

(2) Clearly label materials with the project name and number; and

(3) Store materials per the manufacturer's recommendations.

If storage conditions become unsatisfactory, liens are filed on any materials, or the storage location is changed without approval, the Engineer will deduct any previous payments made for such materials.

d. **Method of Payment.** The Engineer will include payments for acceptably stockpiled materials in the progress estimate following receipt of the Contractor's written request and all required documentation. The Engineer will:

(1) Pay for materials purchased by the Contractor at the delivered cost but not to exceed 85% of the Contract amount for those items.

(2) Pay for materials produced by the Contractor at up to 50% of the Contract amount for those items.

(3) Deduct the Department's cost to inspect materials stored off the limits of the project.

(4) Deduct partial payment quantities as they are incorporated into the project.

The Contractor shall release and discharge the Department from any liability for damages or delays related to the storage or transport of, and to the payment for, material on hand.

The Department's payment for material on hand will not constitute final acceptance by the Department.

90-08 FINAL PAYMENT. When the project has been completed as provided in Subsection 50-15, the Engineer will prepare the final estimate of the quantities of the various classes of work performed. All prior progress estimates and payments shall be subject to correction in the final estimate and payment. The final estimate will not be processed until the Alaska Department of Labor and Workforce Development has verified that final payment can be released. The Department will not process the final estimate until the Contractor completes Items **a** through **d** in the first paragraph of Subsection 50-16.

If the Contractor approves the final estimate, or does not file a claim within 90 days of receiving the final estimate, the estimate shall be processed for final payment. Final payment shall consist of the entire sum found to be due after deducting all previous payments and all amounts to be retained or deducted under the provisions of the Contract. Failure to file a claim within 90 days of receiving the final estimate is a waiver of any and all claims relating to or arising from the final estimate.

When the Contractor approves the final estimate and executes the Contractor's Release form, final payment will be processed.

The Contractor may reserve any unresolved claims that were timely filed according to Subsection 50-17 by listing those claims as exceptions on the Contractor's Release. Any claims listed as exceptions that were not filed before the Contractor executes the final estimate will be considered null and void. Any claims filed in a timely manner but not listed on the Contractor's Release are waived and deemed released.

If the Contractor fails or declines to approve the final estimate within 90 days but does not file any claims, the Department will consider the estimate approved and process the estimate for final payment. Any subsequently raised claims will be considered null and void.

90-09 ELIMINATED ITEMS. When the Contractor is notified of the elimination of a minor Contract item, the Contractor will be reimbursed for actual work performed and all direct costs incurred before notification. In no case will any payment be made for loss of anticipated profits or overhead.

Should it become necessary to eliminate a major Contract item, an equitable adjustment will be made and the Contract modified in writing accordingly.

SECTION 100

CONTRACTOR QUALITY CONTROL PROGRAM

100-01 GENERAL. The Contractor shall assure that all materials and completed construction conform to contract Plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. When required, the Contractor shall establish, provide, and maintain an effective Quality Control Program that details the methods and procedures that will be used. Although guidelines are established and certain minimum requirements are specified herein and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The intent of this section is to enable the Contractor to establish a necessary level of control that will:

a. Adequately provide for the production of acceptable quality materials.

b. Provide sufficient information to assure both the Contractor and the Engineer that the specification requirements can be met.

c. Allow the Contractor as much latitude as possible to develop their own standard of control.

The Contractor shall be prepared to discuss and present, at the preconstruction conference, their understanding of the quality control requirements. The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the Quality Control Program has been reviewed by the Engineer. No partial payment will be made for materials subject to specific quality control requirements until the Quality Control Program has been reviewed.

The quality control requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the acceptance testing requirements. Acceptance testing requirements are the responsibility of the Engineer.

100-02 DESCRIPTION OF PROGRAM.

a. General Description. The Contractor shall establish a Quality Control Program to perform inspection and testing of each item of work for which it is required by the technical specifications, including those performed by subcontractors. This Quality Control Program shall ensure conformance to applicable specifications and Plans with respect to materials, workmanship, construction, finish, and functional performance. The Quality Control Program shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of quality control.

b. Quality Control Program. The Contractor shall describe the Quality Control Program in a written document which shall be reviewed by the Engineer prior to the start of any production, construction, or off-site fabrication. The written Quality Control Program shall be submitted to the Engineer for review at least 5 calendar days before the preconstruction conference.

The Quality Control Program shall be organized to address, as a minimum, the following items:

a. Quality control organization;

b. Project progress schedule;

c. Submittals schedule;

d. Inspection requirements;

e. Quality control testing plan;

f. Documentation of quality control activities; and

g. Requirements for corrective action when quality control and/or acceptance criteria are not met.

The Contractor is encouraged to add any additional elements to the Quality Control Program that he/she deems necessary to adequately control all production and/or construction processes required by this contract.

100-03 QUALITY CONTROL ORGANIZATION. The Contractor's Quality Control Program shall be implemented by the establishment of a separate quality control organization. An organizational chart shall be developed to show all quality control personnel and how these personnel integrate with other management/production and construction functions and personnel.

The organizational chart shall identify all quality control staff by name and function, and shall indicate the total staff required to implement all elements of the Quality Control Program, including inspection and testing for each item of work. If necessary, different technicians can be utilized for specific inspection and testing functions for different items of work. If an outside organization or independent testing laboratory is used for implementation of all or part of the Quality Control Program, the personnel assigned shall be subject to the qualification requirements of Subsection 100-03a and 100-03b. The organizational chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

The quality control organization shall consist of the following minimum personnel:

a. Program Administrator. The Program Administrator shall be a full-time employee of the Contractor, or a consultant engaged by the Contractor. The Program Administrator shall have a minimum of 5 years of experience in airport and/or highway construction and shall have had prior quality control experience on a project of comparable size and scope as the contract.

Additional qualifications for the Program Administrator shall include at least one of the following requirements:

(1) Professional engineer with 1 year of airport paving experience acceptable to the Engineer.

(2) Engineer-in-training with 2 years of airport paving experience acceptable to the Engineer.

(3) An individual with 3 years of highway and/or airport paving experience acceptable to the Engineer, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

(4) Construction materials technician certified at Level III by the National Institute for Certification in Engineering Technologies (NICET).

(5) Highway materials technician certified at Level III by NICET.

(6) Highway construction technician certified at Level III by NICET.

(7) A NICET certified engineering technician in Civil Engineering Technology with 5 years of highway and/or airport paving experience acceptable to the Engineer.

The Program Administrator shall have full authority to institute any and all actions necessary for the successful implementation of the Quality Control Program to ensure compliance with the contract Plans and technical specifications. The Program Administrator shall report directly to a responsible officer of the construction firm. The Program Administrator may supervise the Quality Control Program on more than one project provided that person can be at the job site within 2 hours after being notified of a problem.

b. Quality Control Technicians. A sufficient number of quality control technicians necessary to adequately implement the Quality Control Program shall be provided. These personnel shall be either engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II or higher construction materials technician or highway construction technician and shall have a minimum of 2 years of experience in their area of expertise.

The quality control technicians shall report directly to the Program Administrator and shall perform the following functions:

(1) Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required by Section 100-05.

(2) Performance of all quality control tests as required by the technical specifications and Section 100-06.

Certification at an equivalent level, by a state or nationally recognized organization will be acceptable in lieu of NICET certification.

c. Staffing Levels. The Contractor shall provide sufficient qualified quality control personnel to monitor each work activity at all times. Where material is being produced in a plant for incorporation into the work, separate plant and field technicians shall be provided at each plant and field placement location. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity. The Quality Control Program shall state where different technicians will be required for different work elements.

100-04 SUBMITTALS SCHEDULE. The Contractor shall submit a detailed listing of all submittals (e.g., mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include:

a. Specification item number;

b. Item description;

c. Description of submittal;

d. Specification Subsection requiring submittal; and

e. Scheduled date of submittal.

100-05 INSPECTION REQUIREMENTS. Quality control inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor as specified by Section 100-07.

Inspections shall be performed daily to ensure continuing compliance with contract requirements until completion of the particular feature of work. These shall include the following minimum requirements:

During plant operation for material production, quality control test results and periodic inspections shall be utilized to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All

equipment utilized in proportioning and mixing shall be inspected to ensure its proper operating condition. The Quality Control Program shall detail how these and other quality control functions will be accomplished and utilized.

During field operations, quality control test results and periodic inspections shall be utilized to ensure the quality of all materials and workmanship. All equipment utilized in placing, finishing, and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance to the technical specifications and are within the plan dimensions, lines, grades, and tolerances specified. The Program shall document how these and other quality control functions will be accomplished and utilized.

100-06 QUALITY CONTROL TESTING PLAN. As a part of the overall Quality Control Program, the Contractor shall implement a quality control testing plan, as required by the technical specifications. The testing plan shall include the minimum tests and test frequencies required by the technical specification Item, as well as any additional quality control tests that the Contractor deems necessary to adequately control production and/or construction processes.

The testing plan can be developed in a spreadsheet fashion and shall, as a minimum, include the following:

a. Specification item number (e.g., P-401);

b. Item description (e.g., Plant Mix Bituminous Pavements);

c. Test type (e.g., gradation, grade, asphalt content);

d. Test standard (e.g., ASTM or AASHTO test number, as applicable);

e. Test frequency (e.g., as required by technical specifications or minimum frequency listed in appendix C when requirements are not stated);

f. Responsibility (e.g., plant technician); and

g. Control requirements (e.g., target, permissible deviations).

The testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples according to ASTM D 3665. The Engineer shall be provided the opportunity to witness quality control sampling and testing.

All quality control test results shall be documented by the Contractor as required by Section 100-07.

100-07 DOCUMENTATION. The Contractor shall maintain current quality control records of all inspections and tests performed. These records shall include factual evidence that the required inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features, and must include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records shall be furnished to the Engineer daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the Contractor's Program Administrator.

Specific Contractor quality control records required for the contract shall include, but are not necessarily limited to, the following records:

a. Daily Inspection Reports. Each Contractor quality control technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations on a form acceptable to the

Engineer. These technician's daily reports shall provide factual evidence that continuous quality control inspections have been performed and shall, as a minimum, include the following:

(1) Technical specification item number and description;

(2) Compliance with approved submittals;

(3) Proper storage of materials and equipment;

(4) Proper operation of all equipment;

(5) Adherence to Plans and technical specifications;

(6) Review of quality control tests; and

(7) Safety inspection.

The daily inspection reports shall identify inspections conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible quality control technician and the Program Administrator. The Engineer shall be provided at least one copy of each daily inspection report on the work day following the day of record.

b. Daily Test Reports. The Contractor shall be responsible for establishing a system which will record all quality control test results. Daily test reports shall document the following information:

(1) Technical specification item number and description;

(2) Test designation;

(3) Location;

(4) Date of test;

(5) Control requirements;

(6) Test results;

(7) Causes for rejection;

(8) Recommended remedial actions; and

(9) Retests.

Test results from each day's work period shall be submitted to the Engineer prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical quality control charts. The daily test reports shall be signed by the responsible quality control technician and the Program Administrator.

100-08 CORRECTIVE ACTION REQUIREMENTS. The Quality Control Program shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the Quality Control Program as a whole, and for individual items of work contained in the technical specifications.

The Quality Control Program shall detail how the results of quality control inspections and tests will be used for determining the need for corrective action and shall contain clear sets of rules to gauge when a process is out of control and the type of correction to be taken to regain process control.

When applicable or required by the technical specifications, the Contractor shall establish and utilize statistical quality control charts for individual quality control tests. The requirements for corrective action shall be linked to the control charts.

100-09 INSPECTION BY THE ENGINEER. All items of material and equipment shall be subject to inspection by the Engineer at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate quality control system in conformance with the requirements detailed herein and the applicable technical specifications and Plans. In addition, all items of materials, equipment and work in place shall be subject to inspection by the Engineer at the site for the same purpose.

Inspection by the Engineer does not relieve the Contractor of performing quality control inspections of either on-site or off-site Contractor's or subcontractor's work.

100-10 NONCOMPLIANCE.

a. The Engineer will notify the Contractor of any noncompliance with any of the foregoing requirements. The Contractor shall, after receipt of such notice, immediately take corrective action. Any notice, when delivered by the Engineer or their authorized representative to the Contractor or their authorized representative at the site of the work, shall be considered sufficient notice.

b. In cases where quality control activities do not comply with either the Contractor's Quality Control Program or the contract provisions, or where the Contractor fails to properly operate and maintain an effective Quality Control Program, as determined by the Engineer, the Engineer may:

(1) Order the Contractor to replace ineffective or unqualified quality control personnel or subcontractors.

(2) Order the Contractor to stop operations until appropriate corrective action is taken.

SECTION 110

METHOD OF ESTIMATING PERCENTAGE OF MATERIAL WITHIN SPECIFICATION LIMITS (PWL)

110-01 GENERAL. When the Specifications provide for acceptance of material based on the method of estimating percentage of material within specification limits (PWL), the PWL will be determined according to this section. All test results for a lot will be analyzed statistically to determine the total estimated percent of the lot that is within specification limits. The PWL is computed using the sample average (X) and sample standard deviation (Sn) of the specified number (n) of sublots for the lot and the specification tolerance limits, L for lower and U for upper, for the particular acceptance parameter. From these values, the respective Quality index(s), QL for Lower Quality Index and/or QU for Upper Quality Index, is computed and the PWL for the lot for the specified n is determined from Table 1. Analysis of test results will be based on an Acceptable Quality Level (AQL) of 95.0% and a contractor's risk of 5.0% unless otherwise specified. AQL may be viewed as the lowest percent within the specification limits of a material that is acceptable as a process average and receive 100% pay. The Contractor's risk is the probability that when the Contractor is producing material at exactly the AQL, the materials will receive less than 1.00 pay factor.

There is some degree of uncertainty (risk) in the measurement for acceptance because only a small fraction of production material (the population) is sampled and tested. This uncertainty exists because all portions of the production material have the same probability to be randomly sampled. The Contractor's risk is the probability that material produced at the acceptable quality level is rejected or subjected to a pay adjustment. The Department's risk is the probability that material produced at the rejectable quality level is accepted.

IT IS THE INTENT OF THIS SECTION TO INFORM THE CONTRACTOR THAT, IN ORDER TO CONSISTENTLY OFFSET THE CONTRACTOR'S RISK FOR MATERIAL EVALUATED, PRODUCTION QUALITY (USING POPULATION AVERAGE AND POPULATION STANDARD DEVIATION) MUST BE MAINTAINED AT THE ACCEPTABLE QUALITY SPECIFIED OR HIGHER. IN ALL CASES, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PRODUCE AT QUALITY LEVELS THAT WILL MEET THE SPECIFIED ACCEPTANCE CRITERIA WHEN SAMPLED AND TESTED AT THE FREQUENCIES SPECIFIED.

110-02 METHOD FOR COMPUTING PWL. The computational sequence for computing PWL is as follows:

a. Divide the lot into n sublots according to the acceptance requirements of the specification.

b. Locate the random sampling position within the sublot according to the requirements of the specification. Make a measurement at each location, or take a test portion and make the measurement on the test portion according to the testing requirements of the specification.

c. Discard outliers as determined by ATM SP-7.

d. Find the sample average (X) for all remaining sublot values within the lot by using the following formula:

$$X = (x_1 + x_2 + x_3 + \ldots x_n) / n$$

Where:
X = Sample average of all sublot values within a lot
x_1, x_2 = Individual sublot values
n = Number of sublots

e. Find the sample standard deviation (S_n) by use of the following formula:

$$S_n = [(d_1^2 + d_2^2 + d_3^2 + \ldots d_n^2)/(n-1)]^{1/2}$$

Where:
S_n = Sample standard deviation of the number of sublot values in the set
$d_1, d_2, \ldots$ = Deviations of the individual sublot values $x_1, x_2, \ldots$ from the average value X
that is: $d_1 = (x_1 - X)$, $d_2 = (x_2 - X) \ldots d_n = (x_n - X)$
n = Number of sublots

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

f. For single sided specification limits (i.e., L only), compute the Lower Quality Index Q_L by use of the following formula:

$$Q_L = (X - L) / Sn$$

Where:
L = specification lower tolerance limit
Q_L = Lower Quality Index

Estimate the percentage of material within limits (PWL) by entering Table 1 with Q_L, using the column appropriate to the total number (n) of measurements. Q_L is rounded to the nearest hundredth.

g. For double sided specification limits (i.e. L and U), compute the Quality Indexes Q_L and Q_U by use of the following formulas:

$$Q_L = (X - L) / S_n \quad \text{and} \quad Q_U = (U - X) / S_n$$

Where:
L and U = specification lower and upper tolerance limits. Limits for the largest sieve specified will be plus 0% and minus 1%.
Q_L = Lower Quality Index
Qu = Upper Quality Index

QL and QU are rounded to the nearest hundredth.

Estimate the percentage of material between the lower (L) and upper (U) tolerance limits (PWL) by entering Table 1 separately with Q_L and Q_U, using the column appropriate to the total number (n) of measurements, and determining the percent of material above P_L and percent of material below P_U for each tolerance limit. Determine the PWL by use of the following formula:

$$PWL = (P_U + P_L) - 100$$

Where:
P_L = percent within lower specification limit
P_U = percent within upper specification limit

EXAMPLE OF PWL CALCULATION

(This is an example PWL determination of five random samples from Lot 1. Cores for mat density are used for this example. Follow the same basic procedure for all acceptance criteria requiring a PWL calculation.)

Project: Example Project
Test Item: Item 401a, Lot 1

1. Densities of five random core samples from Lot 1 (n = 5).
   x_1 (D-1) = 93
   x_2 (D-2) = 94
   x_3 (D-3) = 92
   x_4 (D-4) = 95
   x_5 (D-5) = 95

2. Calculate average density (X) for Lot 1.
   $X = (x_1 + x_2 + x_3 + x_4 + x_5)/n$
   $X = (93 + 94 + 92 + 95 + 95)/5$
   X = 93.8 percent density

3. Calculate the standard deviation (S_n) for Lot 1.
   $S_n = [(\{x_1-X\}^2+\{x_2-X\}^2+\{x_3-X\}^2+\{x_4-X\}^2+\{x_5-X\}^2)/n-1)]^{1/2}$
   $S5 = [(\{93-93.8\}^2+\{94-93.8\}^2+\{92-93.8\}^2+\{95-93.8\}^2+\{95-93.8\}^2)/5-1]^{1/2}$
   $S5 = [(0.64+0.04+3.24+1.44+1.44)/4]^{1/2}$
   $S5 = [1.70]^{1/2}$
   S5 = 1.30

4. Calculate the lower Quality Index (Q_L) for Lot 1. (L = Lower specification limit.)
   $Q_L = (X - L)/S_n$
   $Q_L = (93.8-92)/1.30$
   $Q_L = 1.38$

5. Calculate the upper Quality Index (QU) for Lot 1. (U = Upper specification limit.)
   $Q_U = (U - X)/S_n$
   $Q_U = (98-93.8)/1.30$
   $Q_U = 3.23$

6. Determine the percent within lower specification limits (P_L) from Table 1.
   For n = 5 and QL = 1.38, PL = 94

7. Determine the percent within upper specification limits (PU) from Table 1.
   For n = 5 and Q_U = 3.23, P_U = 100

8. Calculate mat density PWL for LOT 1.
   $PWL = (P_L + P_U) - 100$
   $PWL = (94 + 100) - 100$
   PWL = 94

TABLE 1. Table for Estimating Percent of Lot Within Limits (PWL)

For negative values of Q_U or Q_L, use absolute values of Q_U or Q_L and determine P_U or P_L from the table. The P_U or P_L associated with the negative Q_U or Q_L value is equal to 100 minus the table value of P_U or P_L.

P_U or P_L	n = 3	n = 4	n = 5	n = 6	n = 7
	Upper or Lower Quality Index (Q_U or Q_L)				
100	1.16-50.0	1.48-50.0	1.68-50.0	1.81-50.0	1.90-50.0
99	-	1.45-1.47	1.61-1.67	1.71-1.80	1.77-1.89
98	1.15	1.42-1.44	1.55-1.60	1.63-1.70	1.68-1.76
97	-	1.39-1.41	1.50-1.54	1.56-1.62	1.60-1.67
96	1.14	1.36-1.38	1.45-1.49	1.50-1.55	1.53-1.59
95	-	1.33-1.35	1.40-1.44	1.44-1.49	1.47-1.52
94	1.13	1.30-1.32	1.36-1.39	1.39-1.43	1.41-1.46
93	-	1.27-1.29	1.32-1.35	1.34-1.38	1.36-1.40
92	1.12	1.24-1.26	1.28-1.31	1.30-1.33	1.31-1.35
91	1.11	1.21-1.23	1.24-1.27	1.25-1.29	1.26-1.30
90	1.10	1.18-1.20	1.20-1.23	1.21-1.24	1.21-1.25
89	1.08-1.09	1.15-1.17	1.16-1.19	1.17-1.20	1.17-1.20
88	1.07	1.12-1.14	1.13-1.15	1.13-1.16	1.13-1.16
87	1.05-1.06	1.09-1.11	1.09-1.12	1.09-1.12	1.09-1.12
86	1.04	1.06-1.08	1.06-1.08	1.05-1.08	1.05-1.08
85	1.02-1.03	1.03-1.05	1.02-1.05	1.02-1.04	1.01-1.04
84	1.01	1.00-1.02	0.99-1.01	0.98-1.01	0.98-1.00
83	0.98-1.00	0.97-0.99	0.96-0.98	0.95-0.97	0.94-0.97
82	0.97	0.94-0.96	0.92-0.95	0.91-0.94	0.91-0.93
81	0.94-0.96	0.91-0.93	0.89-0.91	0.88-0.90	0.87-0.90
80	0.92-0.93	0.88-0.90	0.86-0.88	0.85-0.87	0.84-0.86
79	0.90-0.91	0.85-0.87	0.83-0.85	0.81-0.84	0.81-0.83
78	0.88-0.89	0.82-0.84	0.79-0.82	0.78-0.80	0.77-0.80
77	0.85-0.87	0.79-0.81	0.76-0.78	0.75-0.77	0.74-0.76
76	0.83-0.84	0.76-0.78	0.73-0.75	0.72-0.74	0.71-0.73
75	0.80-0.82	0.73-0.75	0.70-0.72	0.69-0.71	0.68-0.70
74	0.77-0.79	0.70-0.72	0.67-0.69	0.66-0.68	0.65-0.67
73	0.75-0.76	0.67-0.69	0.64-0.66	0.63-0.65	0.62-0.64
72	0.72-0.74	0.64-0.66	0.61-0.63	0.60-0.62	0.59-0.61
71	0.69-0.71	0.61-0.63	0.58-0.60	0.57-0.59	0.56-0.58
70	0.66-0.68	0.58-0.60	0.55-0.57	0.54-0.56	0.53-0.55
69	0.63-0.65	0.55-0.57	0.52-0.54	0.51-0.53	0.50-0.52
68	0.60-0.62	0.52-0.54	0.48-0.51	0.48-0.50	0.47-0.49
67	0.57-0.59	0.49-0.51	0.46-0.47	0.45-0.47	0.45-0.46
66	0.53-0.56	0.46-0.48	0.44-0.45	0.42-0.44	0.42-0.44
65	0.50-0.52	0.43-0.45	0.41-0.43	0.40-0.41	0.39-0.41
64	0.47-0.49	0.40-0.42	0.38-0.40	0.37-0.39	0.36-0.38
63	0.44-0.46	0.37-0.39	0.35-0.37	0.34-0.36	0.33-0.35
62	0.40-0.43	0.34-0.36	0.32-0.34	0.31-0.33	0.31-0.32
61	0.37-0.39	0.31-0.33	0.29-0.31	0.28-0.30	0.28-0.30
60	0.33-0.36	0.28-0.30	0.26-0.28	0.26-0.27	0.25-0.27
59	0.30-0.32	0.25-0.27	0.24-0.25	0.23-0.25	0.22-0.24
58	0.26-0.29	0.22-0.24	0.21-0.23	0.20-0.22	0.20-0.21
57	0.23-0.25	0.19-0.21	0.18-0.20	0.17-0.19	0.17-0.19
56	0.19-0.22	0.16-0.18	0.15-0.17	0.15-0.16	0.14-0.16
55	0.15-0.18	0.13-0.15	0.12-0.14	0.12-0.14	0.12-0.13
54	0.12-0.14	0.10-0.12	0.09-0.11	0.09-0.11	0.09-0.11
53	0.08-0.11	0.07-0.09	0.07-0.08	0.06-0.08	0.06-0.08
52	0.05-0.07	0.04-0.06	0.04-0.06	0.04-0.05	0.04-0.05
51	0.01-0.04	0.01-0.03	0.01-0.03	0.01-0.03	0.01-0.03
50	0.00	0.00	0.00	0.00	0.00

P_U or P_L	n = 8	n = 9	n = 10 to 11	n = 12 to 14	n = 15 to 18
	Upper or Lower Quality Index (Q_U or Q_L)				
100	1.96-50.0	2.01-50.0	2.05-50.0	2.10-50.0	2.15-50.0
99	1.82-1.95	1.85-2.00	1.87-2.04	1.92-2.09	1.94-2.14
98	1.71-1.81	1.73-1.84	1.75-1.86	1.78-1.91	1.80-1.93
97	1.62-1.70	1.64-1.72	1.66-1.74	1.68-1.77	1.69-1.79
96	1.55-1.61	1.56-1.63	1.57-1.65	1.59-1.67	1.60-1.68
95	1.48-1.54	1.49-1.55	1.50-1.56	1.51-1.58	1.52-1.59
94	1.42-1.47	1.43-1.48	1.44-1.49	1.45-1.50	1.45-1.51
93	1.37-1.41	1.37-1.42	1.38-1.43	1.38-1.44	1.39-1.44
92	1.31-1.36	1.32-1.36	1.32-1.37	1.33-1.37	1.33-1.38
91	1.26-1.30	1.27-1.31	1.27-1.31	1.27-1.32	1.28-1.32
90	1.22-1.25	1.22-1.26	1.22-1.26	1.22-1.26	1.23-1.27
89	1.17-1.21	1.17-1.21	1.18-1.21	1.18-1.21	1.18-1.22
88	1.13-1.16	1.13-1.16	1.13-1.17	1.13-1.17	1.13-1.17
87	1.09-1.12	1.09-1.12	1.09-1.12	1.09-1.12	1.09-1.12
86	1.05-1.08	1.05-1.08	1.05-1.08	1.05-1.08	1.05-1.08
85	1.01-1.04	1.01-1.04	1.01-1.04	1.01-1.04	1.01-1.04
84	0.97-1.00	0.97-1.00	0.97-1.00	0.97-1.00	0.97-1.00
83	0.94-0.96	0.94-0.96	0.93-0.96	0.93-0.96	0.93-0.96
82	0.90-0.93	0.90-0.93	0.90-0.92	0.90-0.92	0.89-0.92
81	0.87-0.89	0.87-0.89	0.86-0.89	0.86-0.89	0.86-0.88
80	0.83-0.86	0.83-0.86	0.83-0.85	0.83-0.85	0.82-0.85
79	0.80-0.82	0.80-0.82	0.80-0.82	0.79-0.82	0.79-0.81
78	0.77-0.79	0.77-0.79	0.76-0.79	0.76-0.78	0.76-0.78
77	0.74-0.76	0.73-0.76	0.73-0.75	0.73-0.75	0.72-0.75
76	0.71-0.73	0.70-0.72	0.70-0.72	0.70-0.72	0.69-0.71
75	0.67-0.70	0.67-0.69	0.67-0.69	0.67-0.69	0.66-0.68
74	0.64-0.66	0.64-0.66	0.64-0.66	0.63-0.66	0.63-0.65
73	0.61-0.63	0.61-0.63	0.61-0.63	0.60-0.62	0.60-0.62
72	0.58-0.60	0.58-0.60	0.58-0.60	0.58-0.59	0.57-0.59
71	0.56-0.57	0.55-0.57	0.55-0.57	0.55-0.57	0.54-0.56
70	0.53-0.55	0.52-0.54	0.52-0.54	0.52-0.54	0.51-0.53
69	0.50-0.52	0.49-0.51	0.49-0.51	0.49-0.51	0.49-0.50
68	0.47-0.49	0.47-0.48	0.46-0.48	0.46-0.48	0.46-0.48
67	0.44-0.46	0.44-0.46	0.44-0.45	0.43-0.45	0.43-0.45
66	0.41-0.43	0.41-0.43	0.41-0.43	0.41-0.42	0.40-0.42
65	0.39-0.40	0.38-0.40	0.38-0.40	0.38-0.40	0.38-0.39
64	0.36-0.38	0.36-0.37	0.35-0.37	0.35-0.37	0.35-0.37
63	0.33-0.35	0.33-0.35	0.33-0.34	0.32-0.34	0.32-0.34
62	0.30-0.32	0.30-0.32	0.30-0.32	0.30-0.31	0.30-0.31
61	0.28-0.29	0.27-0.29	0.27-0.29	0.27-0.29	0.27-0.29
60	0.25-0.27	0.25-0.26	0.25-0.26	0.24-0.26	0.24-0.26
59	0.22-0.24	0.22-0.24	0.22-0.24	0.22-0.23	0.22-0.23
58	0.20-0.21	0.19-0.21	0.19-0.21	0.19-0.21	0.19-0.21
57	0.17-0.19	0.17-0.18	0.17-0.18	0.17-0.18	0.16-0.18
56	0.14-0.16	0.14-0.16	0.14-0.16	0.14-0.16	0.14-0.15
55	0.12-0.13	0.11-0.13	0.11-0.13	0.11-0.13	0.11-0.13
54	0.09-0.11	0.09-0.10	0.09-0.10	0.09-0.10	0.09-0.10
53	0.06-0.08	0.06-0.08	0.06-0.08	0.06-0.08	0.06-0.08
52	0.04-0.05	0.04-0.05	0.04-0.05	0.04-0.05	0.04-0.05
51	0.01-0.03	0.01-0.03	0.01-0.03	0.01-0.03	0.01-0.03
50	0.00	0.00	0.00	0.00	0.00

ITEM F-162 CHAIN-LINK FENCE

DESCRIPTION

162-1.1 This item shall consist of furnishing and erecting a chain-link fence according to these specifications and the details shown on the Plans.

MATERIALS

162-2.1 FABRIC. Chain-link fabric shall meet AASHTO M 181, 9-gage thickness, Type I (zinc-coated steel), Class ~~C or~~ D coating, and 2-inch mesh.

162-2.2 BARBED WIRE. Barbed wire shall meet AASHTO M 280, Design Number 12-4-5-14R, Standard Grade, Coating Type Z, and Coating Class 3.

162-2.3 POSTS, RAILS AND BRACES. Line posts, rails, and braces shall be galvanized steel pipe, or equivalent galvanized roll-formed sections, and meet AASHTO M 181, Type I, Grade 1 or Grade 2.

The dimensions of the posts, rails, and braces shall be as shown on the Plans.

162-2.4 GATES. Gate frames shall consist of galvanized steel pipe, or equivalent galvanized roll-formed sections, and shall meet AASHTO M 181, Type I, Grade 1 or Grade 2. The fabric shall be of the same type material as used in the fence.

162-2.5 WIRE TIES AND TENSION WIRES. Wire ties for use in conjunction with a given type of fabric shall be of the same material and coating weight identified with the fabric type. Tension wire shall meet AASHTO M 181, Type I, Class 3 coating.

162-6 MISCELLANEOUS FITTINGS AND HARDWARE. Miscellaneous steel fittings and hardware shall meet AASHTO M 181, Type I, Grade 1 Barbed wire support arms shall withstand a load of 250 pounds applied vertically to the outermost end of the arm.

162-2.7 CONCRETE. Concrete shall be of a commercial grade with a minimum 28-day compressive strength of 2,500 psi or an approved, pre-mixed, sacked concrete.

162-2.8 MARKING. Each roll of fabric shall carry a tag showing the kind of base metal, kind of coating, the gage of the wire, the length of fencing in the roll, and the name of the manufacturer. Posts, wire, and other fittings shall be identified as to manufacturer, kind of base metal, and kind of coating.

162-2.9 GATE LOCKS. Gate locks shall be provided for each gate and shall be brass, restricted keyway padlocks with a shackle that is 3/8 inch in diameter having a closed clearance of 2-1/4 inches. The locks shall have control key removable cores and each lock shall have a separate replacement core. All cores shall be keyed differently. The Contractor shall provide 4 keys per lock, and 2 core-removal keys.

162-2.10 KEYLESS LOCKS. When specified, a changeable combination lock shall be furnished with pedestrian gates. The keyless lock shall have a 4- or 5-digit mechanism and shall be an Ilco Unican Model 1011 or approved equal. A sign, 12 inches by 12 inches, shall be securely mounted on the inside of the gate. The sign shall be shielded from view from outside of the gate by means of a hinged 12-inch by 12-inch cover or other means approved by the Engineer. The cover shall have the legend "LIFT AND RECORD COMBINATION FOR REENTRY". The sign shall be aluminum sheet with white reflective coating. Letters shall be black and a minimum of 3/4 inch tall.

CONSTRUCTION METHODS

162-3.1 GENERAL. The fence shall be constructed according to the details on the Plans and as specified herein using new materials. The Contractor shall be responsible for establishing the fence alignment as shown on the Plans. After the fence line has been staked and prior to fence installation, the Contractor shall review the alignment with the Engineer and make required adjustments to avoid conflicts.

162-3.2 CLEARING FENCE LINE. All trees, brush, stumps, logs, and other debris which would interfere with the proper construction of the fence in the required location shall be removed a minimum width of 10 feet on each side of the fence centerline before starting fencing operations.

162-3.3 INSTALLING POSTS. All end posts, corner posts and pull posts shall be set in concrete at the required dimensions and depths and at the spacing shown on the Plans. Line posts may be either set in concrete as shown on the Plans or driven a minimum of 5 feet embedment. Pull posts shall have a maximum spacing of 250 feet.

Posts shall be spaced as shown on the Plans but in no case shall spacing be more than 10 feet. The post holes shall be in proper alignment so that there is a minimum of 3 inches of concrete on all sides of the posts. The concrete shall be thoroughly compacted around the posts by tamping or vibrating and shall have a smooth finish slightly higher than the ground and sloped to drain away from the posts. All posts shall be set plumb and to the required grade and alignment. No materials shall be installed on the posts, nor shall the posts be disturbed in any manner within 7 days after the individual post footing is completed.

Should rock be encountered at a depth less than the planned embedment depth, a hole 2 inches larger than the greatest dimension of the posts shall be drilled to a depth of 12 inches. After the posts are set, the remainder of the drilled hole shall be filled with grout, composed of one part Portland cement and two parts mortar sand. Any remaining space above the rock shall be filled with concrete in the manner described above.

In lieu of drilling, the rock may be excavated to the required embedment depth.

162-3.4 INSTALLING TOP RAILS. The top rail shall be continuous and shall pass through the post tops. The coupling used to join the top rail lengths shall allow for expansion.

162-3.5 INSTALLING BRACES. Horizontal brace rails, with diagonal truss rods and turnbuckles, shall be installed at all terminal posts.

162-3.6 INSTALLING FABRIC. The wire fabric shall be firmly attached to the posts and braced in the manner shown on the Plans. All wire shall be stretched taut and shall be installed to the required elevations. The fence shall generally follow the contour of the ground, with the bottom of the fence fabric no less than 1 inch or more than 4 inches from the ground surface. Grading shall be performed where necessary to provide a neat appearance.

At locations of small natural swales or drainage ditches and where it is not practical to have the fence conform to the general contour of the ground surface, longer posts may be used and multiple strands of barbed wire stretched thereon to span the opening below the fence. The vertical clearance between strands of barbed wire shall be 6 inches or less.

162-3.7 ELECTRICAL GROUNDS. Electrical grounds shall be installed along the fence between gate openings and at intervals not exceeding 500 feet. Electrical grounds shall also be installed where a power line passes over the fence. The ground shall be accomplished with a copper clad rod 8 feet long and a minimum of 5/8 inch diameter driven vertically until the top is 6 inches below the ground surface. A No. 6 solid copper conductor shall be clamped to the rod and to the fence in such a manner that each element of the fence is grounded.

METHOD OF MEASUREMENT

162-4.1. Chain-link fence will be measured along the top of the fence from center to center of end posts, excluding the length occupied by gate openings.

162-4.2. Gates will be measured as complete units.

BASIS OF PAYMENT

162-5.1 Payment will be made at the contract unit price per linear foot for fence and per each for gates.

Work and materials involved in clearing and disposal of material along the fence line, rock excavation, and ground rod installation are subsidiary.

Payment will be made under:

Item F-162a	8' Chain-Link Fence - per linear foot
Item F-162b	4' Single Swing Gate - per each
Item F-162c	(Width) Double Swing Gate - per each
Item F-162d	(Width) Single Cantilever Gate - per each
Item F-162e	(Width) Double Cantilever Gate - per each
Item F-162f	(Width) Pedestrian Gate (w/Keyless Lock) - per each

MATERIAL REQUIREMENTS

AASHTO M 181	Chain-Link Fence
AASHTO M 280	Metallic-Coated (Carbon) Steel Barbed Wire

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 A-53.

b. **Concrete.** Use commercial grade concrete with a minimum 28-day compressive strength of 2,500 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, alipahtic 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 AASHTO M 268, Type III-A. 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 degrees 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 F-170a Steel Bollard - per each
Item F-170b Steel Bollards - per lump sum

ITEM G-100 MOBILIZATION AND DEMOBILIZATION

DESCRIPTION

100-1.1 This item consists of preparatory work and operations, including but not limited to operations necessary to move personnel, equipment, supplies and incidentals to the project site; to establish offices, buildings and other facilities, except as provided under Section G-130; to perform all other work and operations, including costs incurred, before beginning work on the project; and to complete similar demobilization activities, including submittals such as as-builts, certificates, payrolls, civil rights reports, equipment warranties, etc.

METHOD OF MEASUREMENT

100-2.1 Payment for mobilization and demobilization will be made in partial payments as follows:

a. Up to sixty percent of the amount bid for mobilization and demobilization may be paid when equipment and supplies are landed in serviceable condition at the project site and other necessary preparations have been completed so that work can commence on other pay items.

b. The remaining balance will be paid as contractor facilities are dismantled and equipment is removed from the airport property, with the final increment paid upon completion of demobilization or as approved by the Engineer.

The Department reserves the right to require submittal of invoices, receipted bills, payrolls, and other appropriate documents to justify any or all payments under this item.

BASIS OF PAYMENT

100-3.1 Payment will be made at the contract lump sum price for mobilization and demobilization. This price and payment shall be full compensation for all costs associated with this item.

Payment will be made under:

Item G-100a Mobilization and Demobilization - per lump sum

ITEM G-115 WORKER MEALS AND LODGING, OR PER DIEM

DESCRIPTION

115-1.1 This item consists of complying with the Alaska Department of Labor and Workforce Development (DOLWD) requirements for Worker Meals and Lodging, or Per Diem; as described in their July 25, 2005 memo WHPL #197 and the State Laborer's and Mechanic's Minimum Rates of Pay (current issue).

Ensure subcontractors comply with the DOLWD requirements. The direct internet address is http://www.labor.state.ak.us/lss/pamp600.htm.

Ensure facilities meet the Alaska Administrative Code 8 AAC 61.1010 and 8 AAC 61.1040 Occupational Safety and Health Standards, 18 AAC 31 Alaska Food Code, and U. S. Code of Federal Regulations 29 CFR Section 1910.142 Temporary Labor Camps.

Do not consider the cost of Meals and Lodging or Per Diem in setting wages for the worker or in meeting wage requirements under AS 23.10.065 or AS 36.05.

METHOD OF MEASUREMENT

115-2.1 Progress payments for Worker Meals and Lodging, or Per Diem will be computed as equivalent to the percentage, rounded to the nearest whole percent, of the original contract amount earned.

BASIS OF PAYMENT

115-3.1 Payment will be made at the contract lump sum price for Worker Meals and Lodging, or Per Diem. This price and payment shall be full compensation for all costs associated with this item.

Payment will be made under:

Item G-115a Worker Meals and Lodging, or Per Diem - per lump sum

ITEM G-120 DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM
(Federal-Aid Contracts)

120-1.1 DESCRIPTION. The work consists of providing Disadvantaged Business Enterprises (DBEs), as defined in Title 49, CFR (Code of Federal Regulations), Part 26, with the opportunity to participate on an equitable basis with other contractors in the performance of contracts financed in whole, or in part, with funding through the United States Department of Transportation (USDOT). The Contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of USDOT-assisted contracts.

120-1.2 INTERPRETATION. It is the intent of this section to implement the requirements of 49 CFR, Part 26, and the Department's federally approved DBE Program.

120-1.3 ESSENTIAL CONTRACT PROVISION. Failure to comply with the provisions of this section will be considered a material breach of contract, which may result in the termination of this contract or such other remedy as the Department deems appropriate. The Department also considers failure to comply with this section to be so serious as to justify debarment action as provided in AS 36.30.640(4).

120-1.4 DEFINITIONS AND TERMS. The following definitions will apply.

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

b. **Commercially Useful Function (CUF).** The execution of the work of the Contract by a DBE carrying out its responsibilities by actually performing, managing, and supervising the work involved using its own employees and equipment. The DBE shall be responsible, with respect to materials and supplies used on the Contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a commercially useful function, an evaluation of the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the Contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work. Other relevant factors will be considered. The determination of CUF is made by the Engineer after evaluating the way in which the work was performed during the execution of the Contract.

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

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

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

   (3) has been certified by the Department according to 49 CFR, Part 26.

d. **DBE Key Employee.** Permanent employees identified by the DBE owner in its certification file in the Department's Civil Rights Office (CRO).

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

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

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

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

i. **Regular Dealer.** A DBE certified by the Department in a supply category that

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

(2) keeps an inventory in an amount appropriate for the type of work using that product; and

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

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

120-2.1 UTILIZATION GOAL. The DBE Utilization Goal for this contract is shown on Form 25A-324 (DBE Subcontractable Items) as a percentage of the total basic bid amount. A DBE may be considered creditable towards meeting the DBE Utilization Goal at time of Contract award, if the DBE is certified by the Department in a category covering the CUF to be performed at the time of listing on Form 25A-325C (DBE Utilization Report).

A bidder shall demonstrate the ability to meet the DBE Utilization Goal or perform and document all of the required Good Faith Efforts under Subsection 120-3.2 in order to be eligible for award of this Contract.

If the quantity of work of a bid item involving a DBE firm is reduced by the Department, the DBE Utilization Goal on Form 25A-325C will be reduced proportionately.

120-3.1 DETERMINATION OF COMPLIANCE.

a. **Phase I - Bid.** Each bidder must register with the CRO annually according to §§26.11 & 26.53(b)(2)(iv) of 49 CFR, Part 26. Use Form 25D-6. No contract may be awarded to a bidder that has not registered.

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

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

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

(b) The dollar amount of participation by the DBE firm;

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

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

(2) **DBE Utilization Report.** Form 25A-325C listing the certified DBEs to be used to meet the DBE Utilization Goal.

(3) **Good Faith Effort Documentation.** Summary of Good Faith Effort Documentation (Form 25A-332A and attachments) and DBE Contact Reports (Form 25A-321A) if the Contractor submits less DBE utilization on Form 25A-325C than is required to meet the DBE Utilization Goal. If accepted by the Department, this lower DBE utilization becomes the new DBE Utilization Goal. If the bidder cannot demonstrate the ability to meet the DBE Utilization Goal, and can not document the minimum required Good Faith Efforts (as outlined in Subsection 120-3.2 below), the Contracting Officer will determine the bidder to be not responsible.

c. Phase III - Construction.

(1) **Designation of DBE/EEO Officer.** At the preconstruction conference, the Contractor shall submit, in writing, the designation of a DBE/EEO officer.

(2) **DBE Creditable Work.** The CUF work items and creditable dollar amounts shown for a DBE on the DBE Utilization Report (Form 25A-325C) shall be included in any subcontract, purchase order or service agreement with that DBE.

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

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

(b) If the Contractor is unable to find replacement DBE participation and has adequately performed and documented the Good Faith Effort expended according to Subsection 120-3.2.

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

120-3.2 GOOD FAITH EFFORT.

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

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

(1) Consideration of all subcontractable items. The bidder shall, at a minimum, seek DBE participation for each of the subcontractable items upon which the DBE goal was established as identified by the Department (on Form 25A-324) prior to bid opening. It is the bidder's responsibility to make the work listed on the subcontractable items list available to DBE firms, to facilitate DBE participation.

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

(3) Notification to all active DBEs listed for a given region in the Department's most current DBE Directory at least 7 calendar days prior to bid opening. The bidder must give the DBEs no less than five days to respond. The bidder may reject DBE quotes received after the deadline. Such a deadline for bid submission by DBEs will be consistently applied. DBEs certified to perform work items identified on Form 25A-324 must be contacted to solicit their interest in participating in the execution of work with the Contractor. Each contact with a DBE firm will be logged on a Contact Report (Form 25A-321A).

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

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

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

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

(8) Follow-up of initial notifications by contacting DBEs to determine whether or not they will be bidding. Failure to submit a bid by the project bid opening or deadline by the bidder is de facto evidence of the DBE's lack of interest in bidding. Documentation of follow-up contacts shall be logged on the Contact Report (Form 25A-321A).

(9) Items (3) through (8) will be utilized to evaluate any request from the Contractor for a reduction in the DBE Utilization Goal due to the default or decertification of a DBE and the Contractor's subsequent inability to obtain additional DBE participation.

b. Administrative Reconsideration. Under the provisions of 49 CFR. Part 26.53(d), if it is determined that the apparent successful bidder has failed to meet the requirements of this subsection, the bidder must indicate whether they would like an opportunity for administrative reconsideration. Such an opportunity must be exercised by the bidder within 3 calendar days of notification it has failed to meet the requirements of this subsection. As part of this reconsideration, the bidder must provide

written documentation or argument concerning the issue of whether it met the goal or made adequate good faith efforts to do so.

(1) The decision on reconsideration will be made by the DBE Liaison Officer.

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

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

(4) The result of the reconsideration process is not administratively appealable to USDOT.

120-3.3 COMMERCIALLY USEFUL FUNCTION (CUF).

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

(1) regular dealer;
(2) manufacturer;
(3) broker;
(4) subcontractor;
(5) joint-venture; or
(6) prime contractor.

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

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

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

(3) The DBE is certified in the appropriate category at the time of

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

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

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

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

(6) The work of the DBE firm must meet the following criteria when determining when CUF is being performed by the DBE:

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

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

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

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

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

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

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

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

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

(7) On a monthly basis, the Contractor shall report on Form 25A-336 (Monthly Summary of DBE Participation) to the CRO the payments made (canceled checks or bank statements that identify payor, payee, and amount of transfer) for the qualifying work, goods and services provided by DBEs.

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

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

(1) withdrawing the subcontract, purchase order or service agreement from the decertified DBE and expending Good Faith Effort (Subsection 120-3.2, Items (3) through (8) to replace it with one from a currently certified DBE for that same work or service through subcontractor substitution (GCP Subsection 30-01); or

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

(a) increasing the participation of other DBEs on the project;
(b) documenting Good Faith Efforts [Subsection 120-3.2, items (3) through (8)]; or
(c) by a combination of the above.

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

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

120-3.4 DEFAULT OF DBE. In the event that a DBE firm under contract or to whom a purchase order or similar agreement has been issued defaults on their work for whatever reason, the Contractor shall immediately notify the Engineer of the default and the circumstances surrounding the default.

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

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

b. The Contractor is unable to find replacement DBE participation at the same level of DBE commitment and has adequately performed and documented the Good Faith Effort expended according to items **(3)** through **(8)** of Subsection 120-3.2 for the defaulted work; or

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

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

120-4.1 METHOD OF MEASUREMENT. The Contractor will be entitled to count toward the DBE Utilization Goal those monies actually paid to certified DBEs for CUF work performed by the DBE as determined by the Engineer. The Contractor will receive credit for the utilization of the DBEs, as follows:

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

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

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

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

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

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

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

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

120-5.1 BASIS OF PAYMENT. Work under this item is subsidiary to other contract items and no payment will be made for meeting or exceeding the DBE Utilization Goal.

If the Contractor fails to utilize the DBEs listed on Form 25A-325C as scheduled or fails to submit required documentation to verify proof of payment or documentation requested by the Department to help in the determination of CUF, the Department will consider this to be unsatisfactory work. If the Contractor fails to utilize Good Faith Efforts to replace a DBE, regardless of fault (except for Subsection 120-3.4 item c.), the Department will also consider this unsatisfactory work. Unsatisfactory work may result in disqualification of the Contractor from future bidding under GCP Subsection 20-13 and withholding of progress payments consistent with GCP Subsection 90-06.

ITEM G-130 SERVICES TO BE FURNISHED BY THE CONTRACTOR

DESCRIPTION

130-1.1 This work consists of furnishing and maintaining facilities specified in the Contract and listed in the bid schedule for the Department's project administrative personnel to use during the project. Facilities must be fully usable for the specified service. Maintain facilities adequately to preserve their utility. Services include heat, electricity, water and any others required to operate the facility. All facilities remain your property when you complete the work. Locate the sites and acquire all permits required unless otherwise shown on the Plans or specified.

REQUIREMENTS

130-2.1 FIELD OFFICE. Furnish and maintain a suitable office for the Engineer to use during construction. If this office is part of your building, completely partition it from the rest of the structure and provide a separate outside door equipped with a lock. Provide a suitable stove or other heating device with fuel. Furnish adequate electrical lighting and 120-volt, 60-cycle power. Construct the office with at least 500 square foot of floor space and at least 60 square foot of window area, along with adequate ventilation. Provide at least 12 linear feet of shelf space. Equip the field office with sanitary facilities. Provide janitorial services at least weekly. Furnish two private telephone lines with voice/data capability for the exclusive use of the Engineer. Furnish a telephone connected to the first line and the second line is to be available for a dedicated facsimile machine~~/dial-up~~ or a shared facsimile/Internet connection. Provide a broadband Internet connection with ~~send and receive data capability supporting 56~~ a transmission capacity of at least 200 kilobytes per second or higher data transfer rate in at least one direction.

Computers and facsimiles for State personnel are furnished by the State.
~~All long-distance calls made by State personnel and the Internet service provider will be paid by the State. Local calls and all connection fees shall be paid by the Contractor.~~

Provide at least one designated handicap parking space. Make the field office accessible according to the requirements of Americans with Disabilities Act Accessibility Guidelines (ADAAG).

Make the field office available for occupancy two weeks before commencing work on the project through one week after Project Completion.

130-2.2 FIELD LABORATORY. Furnish and maintain a field laboratory for the Engineer to use exclusively throughout the contract. Provide a completely functional installation two weeks before commencing construction work through one week after Project Completion. If the field lab will be located 1300 feet or more from the field office, supply the field lab with sanitary facilities and provide janitorial services weekly.

a. Site. Grade and compact a site for the lab acceptable to the Engineer. Locate and level the structure on this site. If subsequent ground movement causes an unlevel or unstable condition, re-level or re-locate the facility as directed.

b. Main Lab. Provide a weatherproof structure suitable to field test construction materials, with the following minimum functional requirements:

(1) Floor space of 300 square foot.
(2) Two 10 square foot windows that open and lock.
(3) Lockable door(s).
(4) Work bench(es), 30 inches X 16 feet total, 3 feet high.
(5) Shelf space, 12 inches X 16 feet.
(6) One 20-inch deep sink with attached faucet and approved drain.
(7) A ~~gravity-fed~~ 250-gallon tank with jet pump or pressurized constant water supply of acceptable quality .

(8) Electrical service and facilities as follows:

(a) Electrical current, 120/240 V (ac), 60-cycle on 24-hour basis.
(b) Wiring system to support a 40-amp user load demand. At least one 15-amp lighting circuit, and two 20-amp outlet circuits with GFI protection.
(c) Outlets, six duplex outlets conveniently spaced around the lab, consistent with local codes.
(d) Lights, switch by door and either four 100-watt incandescent or eight 40-watt fluorescent.
(e) Exhaust fan, minimum 5 cubic feet per second.

(9) Heating equipment suitable to maintain a uniform 70 °F room temperature.
(10) Storage cabinet, 3 ft X 3 ft X 3 ft, lockable, securely fixed to an inside wall with a hinged door opening outward.
(11) Office desk and 2 chairs.

If the lab is a mobile unit mounted on axles and wheels, block the structure under the frame so that the wheels do not touch the ground and the blocking rests firmly on the prepared site.

c. Auxiliary Lab. Provide a separate weatherproof shed within 20 feet of the main lab structure with the following minimum functional requirements:

(1) Floor 8 ft X 12 ft, ceiling height 8 ft.
(2) Door 48 inches wide and window 5 square foot that opens, both lockable.
(3) Electrical service and facilities as in b.(8), except for the following:

(a) Lighting fixtures, 2 ea.
(b) Outlets, 3 conveniently spaced around the structure.
(c) Wiring system with each circuit GFI protected to satisfy a 20-amp user load demand.

(4) Work table 3 ft X 20 in X 3 ft high, capable of supporting 250 pounds and affixed to an inside wall as directed.

(5) Concrete-slab floor, 8 ft X 8 ft X 4 inches thick, cast-in-place or pre-cast. Install anchor bolts in the floor to accommodate the mounting pattern of the Gilson sieving machine at a location as directed.

(a) Comply with a. above for slab foundation requirements.
(b) Found the slab directly on the prepared site.

d. Access. For all types of installations, if the entryway is located higher than a single 7-inch rise, provide the following:

(1) Stairway, 36-inch width X 11-inch tread X 7-inch rise.
(2) Landing, 4 ft X 4 ft centered on the entryway.
(3) Handrail(s) firmly affixed to the stairway.

e. Lab Equipment and Services. Provide the following:

(1) Propane necessary for the lab operation, including two 100-lb tanks, regulators, hoses, fittings, and incidentals for a functional system.

(2) Specialized sampling equipment such as belt templates or belt sampling devices as required.

(3) Fuel and power necessary to continuously operate the facilities.

130-2.3 CURING SHED. Furnish and maintain a suitable weather tight shed for curing concrete test cylinders, with a suitable box or bins for curing concrete test cylinders.

Provide a box large enough or enough bins to contain at least 6 test cylinders from each pour that the Contractor proposes to make during any 28-day period. Use a box or bins at least 18 inches high and constructed of sturdy wood. Line the box or bins with a canvas or plastic liner to help retain moisture in the sand. Construct a lid to provide access to the box or bins.

Provide suitable heating to maintain the temperature in the box (or shed) between 60 and 80 °F at all times when curing the test cylinders. In addition, provide a suitable room thermometer in the shed to check the temperature.

Provide enough sand at the shed to fill the box or bins to be used for curing and enough water to keep the sand in the box or bins moist during the curing period.

130-2.4 CAMP FACILITIES. Furnish and maintain suitable camp facilities for Department employees and other authorized personnel. The Special Provisions will list an estimated number of employees.

Provide the following camp facilities:

a. Lodging (Bunkhouse and Bedding)
b. Meals (Mess Hall and Kitchen)
c. Sanitary and Other Facilities

Provide all camp facilities according to the applicable chapters of the State of Alaska Department of Labor, *Occupational* and *Industrial Structures Code*, and the State of Alaska Department of Environmental Conservation, *Food Service Regulations*.

Camp facilities for your employees, that meet these requirements, may also be used for State employees.

These Specifications do not exclude the use of roadhouses or lodges located near the project that are available for your use. The Engineer may approve a roadhouse, lodge, or camp, providing the accommodations conform with contract requirements.

Provide camp facilities for use by State employees and other authorized personnel while you are engaged in work at the project site, or in material sources used to supply materials to this project.

Department employees and other authorized personnel must sign a meal and/or lodging sheet after each meal and each night's lodging.

When you use camp facilities, completely remove and dispose of all garbage and/or trash piles, cesspools, septic tanks and leach fields as required by applicable laws and regulations and as directed.

130-2.5 SCALES. When the bid schedule calls for payment for material by weight, other than the barge displacement method, provide one of the following:

a. Commercial weighing system. Permanently installed commercial scales.
b. Project weighing system. Acceptable automatic digital scales and scale house.

Provide scales that record weight at least to the nearest 100 pounds. Maintain scale accuracy to within 0.5% of the correct weight throughout the range of use.

Do not use spring balances.

Do not use belt conveyor scales to determine pay weight. You may use belt conveyor scales to proportion plant blends and mixtures if the scales meet the general requirements for weighing equipment and are calibrated according to the manufacturer's instructions.

You may use batch weights to determine pay quantities when the batching equipment includes an approved and certified automatic weighing, cycling, and monitoring system. If doing so, tare trucks at least once per day or more as directed by the Engineer, and provide proof that their loaded weight does not exceed highway load limits.

Install and maintain platform scales with the platform level and rigid bulkheads at each end. Use a platform long enough to permit simultaneous weighing of all axle loads of the hauling vehicle, including coupled vehicles.

Maintain the accuracy of scales according to the specifications, tolerances and regulations for commercial weighing and measuring devices contained in the National Bureau of Standards, Handbook 44, as adopted by Alaska Statute, Section 45.75.050.(d). All commercial scales are subject to approval according to the Weights and Measures Act, AS 45.75. Have scales reinspected, as directed, to ensure their accuracy, and sealed to prevent tampering or other adjustment after certification.

Provide a weatherproof housing for platform scales to protect the recording equipment and allow the scale operator convenient access to the weigh indicator, scale computer, ticket printer, and the sequential printer. Furnish sanitary lavatory facilities, heating, adequate electrical lighting and 120-volt, 60-cycle power for the scale house.

Furnish competent scale operators to operate the system.

Weighing System: Provide an electronic computerized weighing system (ECWS) with the following capabilities:

a. Computer.

(1) Provide a scale computer that can store project numbers and all pay item descriptions for multiple projects and products that are weighed with the scale system.

Use a computer with a self-reading scale system that includes the scale load cell, a sealed direct reading weight indicator, scale computer, ticket printer, and sequential printer, and can record a complete shift's transaction on a 3.5-inch high-density diskette or other approved storage media.

(2) The scale computer must store the following for each hauling vehicle used on the project:

(a) Vehicle identification number marked on the vehicle
(b) Tare weight
(c) Maximum allowable gross vehicle weight (MAVW)

Make sure the scale operator tares vehicles at least once a day. Perform additional tares, as directed, during hauling operations. Perform tares in the presence of the Engineer, when requested.

The Engineer will ~~calculate the~~ check Contractor provided MAVW for each vehicle (using truck measurements provided by the Contractor) and list all vehicles and their MAVW(s) in the scale house. The MAVW is either the maximum allowable legal weight determined by the Engineer when you cannot haul overloads in the traffic stream, or the manufacturer's recommended maximum allowable gross vehicle weight as certified by the Contractor when vehicles are allowed to haul overloads.

The scale operator should only use MAVWs that the Engineer has provided in writing. Do not issue any tickets to a vehicle until the Engineer provides the MAVW.

(3) During weighing operations, the ECWS should compare each vehicle's gross weight to its MAVW. If the vehicle exceeds its MAVW, the system must alert the scale operator that an "overload" exists. The system should not issue a ticket.

(4) Provide a battery backup for the computer and protection for power surges or brown outs. The computer system must retain all stored data during a power outage and must operate during a power outage to allow you to shut down the hard drive without losing information.

b. **Tickets.** Furnish a ticket printer that prints a legible, serially numbered weigh ticket for the Engineer with the following information on each ticket in the order listed. All weights must be at least to the nearest 100 pounds:

(1) Project number
(2) Item number and description
(3) Date weighed
(4) Time weighed
(5) Ticket number
(6) Vehicle Identification Number
(7) MAVW
(8) Gross weight
(9) Tare weight
(10) Net weight
(11) Subtotal item net weight for each haul unit since start of shift
(12) Accumulated item net weight for all haul units since start of shift

After printing, the weigh ticket must automatically advance to a perforation so it can be torn off and handed to the driver.

Manually weigh and record weights for up to 48 hours during a printer malfunction or break-down, when the Engineer gives you prior written authorization. The manual weighing operation must meet all other contract requirements.

Unless the Engineer gives prior written authorization, you will not receive payment for any material weighed without using the ECWS.

c. **Sequential Printer.** Provide a sequential printer that prints out all transactions (keystrokes) made by the computer concurrently with the ticket printer. For permanent commercial scales, the printer may print at the end of the company's daily shift with the Engineer's approval. The printer must print all scales transactions including tares, voided tickets, and data changes made by the scale operator. The printer must allow for advancing the paper manually so that the scale operator can write notes on the paper when special situations occur, such as voided tickets, incorrect vehicle identification number used, etc. The scale operator should also note these special situations in the Scales Diary.

Submit the printout to the Engineer at the end of each shift. You will not receive payment for any hauled material until the printout is submitted.

d. **Data Diskettes.** Provide the Engineer with a 3.5-inch high-density diskette or other approved storage media at the end of the shift. Record all ticket information produced during the shift. Store data in an approved format.

Download data from the permanent commercial vendor scale computer hard drive directly to a disk at the end of the shift. Do not convert or manipulate data. Provide conversion programs and training so that you can convert data into the information the Engineer requires.

If the diskette is not completely usable, then correct, construct, or reconstruct the data file. Use the sequential printout or other information as a data source, as directed. You will not receive payment

for hauled material on a given date until you deliver an accurate "daily" data file to the Engineer. If the Engineer gives you written permission to weigh without the ECWS for a minor equipment failure, construct an acceptable data file as described above.

e. **Scale Diary.** The Scale Diary is a computer printout or bound book provided by the Engineer. The scale person must complete the Scale Diary and include the following information: dates of action, type of material, source, time the scale opened and time the scale closed, times of scale balance, ticket sequence, time the haul for each material started and stopped, voided ticket numbers, vehicle identification numbers, times of tare and tare weights, and the scale person's signature. Also include the following information on any scale used to weigh materials for payment:

(1) Owner of the scales and scale locations.

(2) Manufacturer's name, model serial number, maximum capacity, and type of scales (single beam, double beam, self-reading, etc.).

(3) Date(s) the scales were installed and/or adjusted.

(4) Scale service company inspections and accuracy checks (attach copy).

(5) Division of Measurement Standards inspections and accuracy checks (attach copy).

(6) Time and dates of notification of any malfunctions.

The Scale Diary remains the Engineer's property.

Submit the Scale Diary to the Engineer at the end of each shift. You will not receive payment for any hauled material until you deliver the Scale Diary to the Engineer.

The system must generate a report, either during or at the end of the day or shift, that summarizes the number of loads and total net weight for each date, project, and product. Submit the original report at the end of each shift.

You will not receive payment for any material hauled in a vehicle that does not conform to the requirements of Subsection 50-12, Load Restrictions, and this Subsection. Dump material from non-conforming vehicles until they conform, then reweigh the vehicles.

When a weighing device indicates less than true weight, you will not receive additional payment for material previously weighed and recorded. When a weighing device indicates more than true weight, all material received after the last previously correct weighing accuracy test will be reduced by the percentage of error that exceeds 0.5%.

If the Engineer incurs extra construction engineering expenses from checking non-machine data entries or other data irregularities, the total value of those expenses will be deducted from the value of the contract item before payment.

Platform scales, scale house and the ECWS remain your property after you complete the work.

130-2.6 NUCLEAR TESTING EQUIPMENT STORAGE SHED. Design, furnish and maintain a weatherproof, heated, and ventilated nuclear densometer/testing equipment storage shed for the Engineer to use exclusively throughout the contract. Install the building at least 15-feet from an occupied area at a location approved by the Engineer. Install the shed before commencement of construction activities and maintain it until one week after project completion. Provide sufficient floor area for the nuclear testing equipment and a portable electric heater to maintain a minimum room temperature of 50 °F in freezing weather. Design the building with enough floor area to provide sufficient clearance between the equipment, heater, and combustibles. Provide a commercial grade metal-clad exterior entrance door of 3'-0" min width by 6'-8"

height with dead-bolt lockset. Hang the door so that hinge pins are not accessible from the exterior. Provide the Engineer with 2 keys to control access. Provide a 5/16" welded steel security chain securely attached inside the structure with tamperproof hardware for the Engineer to secure the testing equipment. Provide 120-volt, 60-cycle power, an interior light, and a wall receptacle for the heater. Secure the structure to the ground with tamperproof anchors to resist wind loads and prevent unauthorized movement of the building. The nuclear testing equipment storage shed remains the property of the Contractor. Remove the shed from the site following project completion.

130-2.7 STORAGE CONTAINER. Furnish, transport and maintain a weathertight, lockable, steel enclosed 20 foot long X 8 foot wide X 8 foot high wooden floored container for the storage of the Department's materials, supplies and testing equipment (but not nuclear equipment). Provide twenty equally spaced fastening points on the interior walls that are capable of securing the Department's contents. Door opening dimensions of the storage container shall be greater than 60 square feet. Supply necessary equipment to lift and move container with minimal disturbance to the Department's contents. The container shall not be moved by skidding or hook lift. The Contractor shall be listed as the shipper on all documents listing and acknowledging receipt of the Department's goods for shipment.

Deliver an empty and clean container to the Regional Materials Laboratory, or location acceptable to the Engineer, three weeks prior to transporting to the project site. Allow 7 days for the Department to load the container. Transport the loaded container to the project site. Set up container at a location approved by the Engineer prior to commencing construction work.

Provide electrical service and other facilities as follows:

- **a.** Electrical current, 120V (ac), 60 cycle on a 24 hour a day basis.
- **b.** Wiring system to support a 20 amp user load demand.
- **c.** 2 GFI protected outlets conveniently spaced on the interior walls.
- **d.** Four 100 watt incandescent or eight 40 watt fluorescent lights located for maximum illumination.
- **e.** Provide a stairway with railing, built to meet the International Building Code, if there is more than 12-inch difference in floor entry and existing ground elevation.

Return the container to the Regional Materials Laboratory, or location acceptable to the Engineer, upon project completion. Allow 7 days for the Department to unload the container. The storage container remains your property after you complete the work.

METHOD OF MEASUREMENT

130-3.1 MEAL. By each meal served to authorized personnel, based on signed meal sheets.

130-3.2 LODGING. By each night's lodging received by authorized personnel based on signed lodging sheets.

130-3.3 NUCLEAR TESTING EQUIPMENT STORAGE SHED. By the number of storage sheds specified, to include all components, installed and accepted as completed units and ready for equipment storage.

130-3.4 STORAGE CONTAINER. By the number of storage containers specified, to include all components, installed and accepted as completed units and ready for materials and equipment storage.

BASIS OF PAYMENT

130-4.1 LUMP SUM ITEMS. Payment for Items G-130a, G-130b and G-130c will be made as follows:

- **a.** A percentage of the lump sum amount, to be determined by the Engineer, will be paid as full compensation for furnishing the facility at the site.

- **b.** The balance of the lump sum amount will be prorated over the anticipated active construction period with a portion included as part of each interim payment, for maintenance, repairs, providing all

utilities, and for removing it from the site. If anticipated construction period changes, the final increment will be held until final payment.

Item G-130a Field Office, includes initial telephone and Internet service costs to provide operational connections.

130-4.2 MEAL. Includes all labor, materials, tools, equipment and supplies required to provide meals to all authorized personnel assigned to, or associated with, the project.

130-4.3 LODGING. Includes all labor, materials, tools, equipment and supplies required to provide lodging for all authorized personnel assigned to, or associated with, the project.

130-4.4 NUCLEAR TESTING EQUIPMENT STORAGE SHED. At the contract unit price to include all labor, materials, tools, equipment and supplies required to furnish and install the shed before commencement of construction, to maintain it for the duration of the project and to remove the shed and electrical service after project completion. Electrical service and utility costs are subsidiary to this item.

130-4.5 STORAGE CONTAINER. At the contract unit price to include all labor, materials, tools, equipment and supplies required to deliver the storage shed to the regional office for loading, to deliver it to the project office, to install it before commencement of construction, to maintain it for the duration of the project, to remove the shed and electrical service after project completion, to deliver it to the regional office for unloading, and to remove the storage shed. Electrical service and utility costs are subsidiary to this item.

130-4.6 SCALES. Furnishing the following is subsidiary: platform scales, scale operators, tickets, scale house, and the ECWS, including all supplies such as weigh tickets, paper, printer ribbons, diskettes, etc., and all maintenance and repair services necessary to keep the system functional.

130-4.7 ENGINEERING COMMUNICATIONS. When pay item G-130j is included in the bid schedule, payment of periodic telephone and Internet charges for State personnel is based on paid receipts from the service provider plus 15 percent. When pay item G-130j is absent from the bid schedule, the State will pay the service provider directly for the periodic charges.

Payment will be made under:

Item G-130a	Field Office - per lump sum
Item G-130b	Field Laboratory - per lump sum
Item G-130c	Curing Shed - per lump sum
Item G-130d	Meal - per each
Item G-130e	Lodging - per each
Item G-130f	Reserved
Item G-130g	Nuclear Testing Equipment Storage Shed – per each
Item G-130h	Storage Container – per each
Item G-130j	Engineering Communications - per contingent sum

ITEM G-131 ENGINEERING TRANSPORTATION

DESCRIPTION

131-1.1 Furnish and maintain vehicles for the exclusive use of the Engineer and their staff throughout the duration of the project.

REQUIREMENT

131-2.1 Provide the specified number of the following vehicle types:

a. **Truck.** Full-size four wheel drive pickup or sport utility vehicle. Less than 3 model years old, in good condition and with less than 36,000 miles on the odometer. Equip vehicles with mud/snow tires, strobe beacons (Whelen 360 or equivalent) and two-way radios set on the airport CTAF (Common Traffic Advisory Frequency).

b. **ATV.** All-terrain vehicle, 4x4, 300 cc minimum, with a 500-lb capacity trailer. Less than 3 model years old, in good condition. Equip with securely attached two-way radio set on the airport CTAF (Common Traffic Advisory Frequency). Equip with a rotating beacon or strobe light.

c. **Snowmachine.** A snowmachine with 440 cc minimum engine size, and with a 500-lb capacity sled. Less than 3 model years old, in good condition.

d. **Boat.** An aluminum boat 20 foot long, and rated to carry a minimum of 1000 pounds. A motor capable of moving the loaded boat at 20 mph. Less than 3 model years old, in good condition.

The Contractor shall furnish all fuels and maintenance. The Contractor is responsible for normal wear and tear, and any other incidental damage, including broken windshields, that might arise during the Departments operation and use.

The Department is responsible for physical damage to any vehicle provided under this section if proximately caused by its negligent operation. The Department will provide non-owned auto liability insurance providing third party liability coverage for any accident during the Department's operation and use.

Obtain the Engineer's approval of vehicles prior to their shipment to the site. Vehicles remain the property of the Contractor and shall be removed from the site following the completion of the work.

METHOD OF MEASUREMENT

131-3.1 Lump sum items will not be measured for payment.

The quantity of per each items will be the number of vehicles provided and maintained for use for the duration of the project at the contract unit price.

BASIS OF PAYMENT

131-4.1 Payment will be made as follows:

a. A percentage of the contract unit price, to be determined by the Engineer, will be paid as full compensation for furnishing the vehicles at the site.

b. The balance of the contract unit price will be prorated over the anticipated active construction period, with a portion included as part of each interim payment, for maintenance, fuel and repairs, and for removing vehicles from the site. If the anticipated construction period changes, the final increment will be held until final payment.

Payment will be made under:

Item G-131a	Engineering Transportation (Truck) - per each
Item G-131b	Engineering Transportation (ATV) - per each
Item G-131c	Engineering Transportation (Snowmachine) - per each
Item G-131d	Engineering Transportation (Boat) - per each
Item G-131e	Engineering Transportation - per lump sum

ITEM G-135 CONSTRUCTION SURVEYING AND MONUMENTS

DESCRIPTION

135-1.1 GENERAL. Perform surveying and staking essential for the completion of the project and perform the necessary calculations required to accomplish the work in conformance with the Plans and Specifications and standard survey and engineering practices.

Furnish and install survey monuments and monument cases in conformance with the Plans or as directed.

135-1.2 DEFINITIONS.

a. **Monument:** A fixed physical object marking a point on the surface of the earth; used to commence or control a survey; mark the boundaries of a parcel of land; or the centerline of a right-of-way corridor. Monuments will be Primary or Secondary, as shown on the Plans.

b. **Point:** An identified spot located on the surface of the earth. For purposes of this definition, a point can be a PK nail, wooden hub, rebar, large nail or other structure capable of being utilized as a marker.

c. **Witness Corner:** A material mark or point usually placed on a property or survey line, at a known distance from a property corner or other survey point. A witness corner is employed to witness the location of a corner/point that cannot be monumented at its true location.

d. **Reference Monument:** A material mark or point placed at a known distance and direction from a property corner or other survey point, usually not on a property or survey line. A reference monument is employed to perpetuate a corner/point that cannot be monumented at its true location or where the corner monument is subject to destruction.

e. **Surveyor:** The Contractor's Professional Land Surveyor, currently registered in the State of Alaska.

MATERIALS

135-2.1 MONUMENT CASES. Castings shall conform to AASHTO M 105, Class 30A. Castings shall be coated with a bituminous damp-proof coating. Bolting tops shall be used.

135-2.2 PRIMARY MONUMENT. A minimum 2-inch diameter nonferrous pipe at least 30 inches long, with a minimum 4-inch flange at the bottom and having magnets attached at the top and bottom. A minimum 2-1/4-inch diameter nonferrous metal cap must be permanently attached to the top. Mark the cap around the outside edge with the words "STATE OF ALASKA DOT&PF". Permanently stamp every monument with the Surveyor's registration number, the year set, and the point/corner identification. Orient cap so that the data may be read facing up-station.

135-2.3 SECONDARY MONUMENT. A minimum 5/8-inch x 30-inch rebar with a 2-inch aluminum cap attached to the top. Permanently stamp every secondary monument with the Surveyor's registration number and the year set.

CONSTRUCTION REQUIREMENTS

135-3.1 GENERAL. Use competent, qualified personnel and suitable equipment for the layout work required and furnish traffic control, stakes, templates, straight-edges and other devices necessary for establishing, checking and maintaining the required points, lines and grades.

Furnish computer services to accomplish the work. Check data received from the computer for completeness and accuracy. As soon as practical after completion of the work, and in no case later than acceptance of the

project, deliver field books, computer forms and computer output data to the Engineer. This data becomes the property of the Department.

Supervise construction surveying personnel. Correct errors resulting from the operations of said personnel at Contractor expense. The Contractor is responsible for the accuracy of the work.

Work classified as Land Surveying under AS 08.48, and work involving the location, control, and monumentation of construction centerline and right-of-way, shall be performed by or under the responsible charge of a Professional Land Surveyor.

Follow the Department's Construction Surveying Requirements.

Ensure that the contract surveyor contacts the Department survey manager prior to performing survey work under this item.

DOT&PF Central Region Survey Manager
(907) 269-0558 (Phone)
(907) 269-0600 (Facsimile)

The Department will provide sufficient centerline or reference thereto, and at least one benchmark to enable the establishment of planned elevations and centerline.

Keep field notes in standard hardbound notebooks in a clear, orderly, and neat manner consistent with Departmental procedures, including titles, numbering, and indexing. Make field books available for inspection by the Engineer's project personnel at any time. Legible copies of the reduced field notes shall be made daily. Store the field books in the Engineer's Project Office during periods of non-use. Copies of the field books shall be kept in a separate secure location.

Perform the following:

a. Staking necessary to delineate clearing and/or grubbing limits.

b. Cross sections necessary for determination of excavation and embankment quantities, including intermediate and/or remeasure cross sections as needed. Take cross sections after clearing and grubbing has been completed.

c. Slope staking.

d. Staking of signs, culverts, minor drainage structures and other appurtenances, including the necessary checking to establish the proper location and grade to best fit the conditions on site.

e. Bridge staking.

f. Setting finishing stakes.

g. Measurement of pay quantities that require measurement.

h. Staking of right-of-way and material source limits ~~as deemed necessary~~.

i. Staking, referencing and other actions required to preserve or restore land monuments and property corners.

j. As-built surveying as required under Section 50-08 Survey Control. Tie as-built measurements and locations to project horizontal and vertical survey control.

k. Asphalt pavement surveying necessary to comply with subsection P-401-5.2 acceptance criteria for smoothness and grade of finished asphalt pavement surfaces.

l. Staking and hubbing of bottom of excavation and the top of each layer in the pavement structure.

m. Provide interim calculations for measured items to the Engineer prior to progress payments for each specific item. Ensure that the calculations are completed, checked, and signed by the person in responsible charge of the work.

~~j.~~n. Other surveying and staking necessary to complete the project.

Notify the Engineer immediately if a Department-established reference point is discovered to be in error or a reset point is not in ~~harmonious~~ relationship to the adjacent centerline points.

Furnish a notekeeper to record field survey notes, including documentation for quantity computations for payment. Ensure that the notekeeper is thoroughly familiar with generally accepted standards of good survey notekeeping practice and the Department's Construction Surveying Requirements.

The Engineer may randomly spot check the Contractor's surveys, staking, and computations. After the survey or staking has been completed, provide the Engineer with a minimum of 72 hours notice before performing work, and furnish the appropriate data, to allow for random spot checking. The Department assumes no responsibility for the accuracy of the work.

Measure, compute, and plot all field-measured pay item quantities, including but not limited to excavation and disposal of asphalt cement concrete (AC), portland cement concrete (PCC) pavement, and classified/unclassified excavation volumes. Stake for measurement and calculation of excavation quantities after AC and PCC pavement removal. Submit a proposed method of measuring and computing volumes to the Engineer in writing for approval before performing any field work under this item.

Provide item quantities, including computations and plots to the Engineer prior to payment for each specific item. The Department will review and accept or modify the quantities provided.

Digital terrain modeling (DTM) may be used in determining earthwork quantities as an alternative to before and after cross sections by average end area if the Engineer has agreed in writing to the DTM method prior to commencement of any field work. If DTM is approved and used, provide plotted cross-sections on 50-foot stations with elevations, offsets and computed end areas in square feet for each section prior to earthwork payments for each item. Provide these cross-sections and associated data for the entire area of earthwork computations along with the terrain model.

Accomplish staking in accordance with the following:

a. Perform the topographic survey by grid or cross section method of surveying 25 feet beyond the project match lines. Take elevation shots at 25-foot intervals, at all terrain breaks, and at topographic features.

b. Record and locate all baselines and connect them to the project's centerline, both horizontally and vertically.

c. Upon completion of the before and after survey, provide the Engineer a grid layout sheet showing the baseline, stations and all spot elevations.

d. Provide the Engineer a contour map of the original ground and an identical size map showing the final elevations with 0.5 foot contour intervals. Provide the Engineer with plotted cross-sections for each station grid with elevations and offsets shown.

e. At the end of each day's work, hand deliver a copy of the downloaded raw data from the data collector, in hard copy form, to the Engineer. This hard copy will be signed by the Contractor or Surveyor. If editing is deemed necessary, show all changes in an amended hard copy.

Provide the above products to the Engineer before payment will be made for that work. Provide as-builts and electronic data to the Engineer prior to final inspection.

135-3.2 CROSS-SECTION SURVEYS. When required, obtain right-angle cross sections to the construction centerline at the interval detailed in the Department's Construction Surveying Requirements.

The following will be supplied by the Department:

a. Construction Plans and Specifications.
b. Design Cross Sections, if any.
c. State of Alaska Land Survey Monument Record forms.
d. Department's Construction Surveying Requirements. One copy.
e. Design centerline grades.

The following shall be required of the Contractor:

a. Field Books (Level, Cross-Section, Slope Stake, etc.). Use "Rite-in-the-Rain" or similar weather resistant hardbound field books. Field books become the property of the Department upon completion of the work.

b. Label the books and number the pages. Make a heading in the appropriate book (date, weather, names and duties of crew members) at the beginning of each day's work.

c. Update the index of the appropriate book at the end of each day's work.

d. Reduce, check, and adjust level notes.

e. The notekeeper shall compute the cross-section level notes and slope stake catches and a different crew member shall check the computation on a continual basis in the field.

f. Enter the grade data, shoulder width and/or ditch distance, stationing, slope, etc., in the slope stake books.

g. Maintain the position and identifying marks of slope stakes and reference points until used for their intended purpose.

h. Correct errors by drawing a line through them and writing the correct entry directly above. Erasures will not be allowed.

i. Return field books and copies of the field books to the Project office at the end of each work day or as directed.

j. Provide copies of grade sheets and temporary bench mark elevations to the Engineer 48 hours before beginning work on unclassified excavation or embankment.

k. The Contractor's survey crews shall comply with approved traffic control plans. Coordinate crew activities with the Worksite Traffic Supervisor.

l. Keep a survey Party Chief diary, and give a copy of the diary to the Engineer each day. The diary shall contain the following information:

(1) Date.

(2) Weather.
(3) Crew members' names and duties.
(4) Type and location of work performed.
(5) Hours worked.
(6) Type of equipment used (brand) and date equipment was double centered or "peg" test was performed.
(7) Signature of person in responsible charge.

m. Submit the survey field notes, for the specific area, relating to monument referencing, before beginning clearing, grubbing or excavation.

n. Draw cross-sections and complete quantity calculations for all earthwork quantities.

135-3.3 MONUMENTS. Install primary and secondary monuments, as called for in the Plans, at the positions established by the Department. Prior to the start of construction, reference monuments, to include property markers/corners and accessories, that may be disturbed or buried during construction. In addition, reference monuments designated for referencing on the Plans. Prepare and record Monument Record Forms in the appropriate Recorder's Office before disturbing monuments. Monument Record Forms may be obtained from the Engineer. Re-establish monuments in their original position before completion of the project. Prepare and file a Monument Record Form for each reestablished monument.

Keep records and report to the Engineer evidence that a monument has been disturbed and is no longer reliable or cannot be located and is presumed to be missing. Establish a minimum of two in-line reference points, or three swing-tie reference points in situations where in-line referencing is not desirable. Set reference points outside of the construction limits. Measure distances from the monument to the nearest 0.01 foot. Record referencing of monuments in a separate field book stamped by the Surveyor.

Replace existing monuments disturbed by construction with Primary or Secondary Monuments meeting the requirements of Subsections 135-2.1 through 3. When it is impractical to establish a monument in its original position, install a witness corner (WC). Place the WC to a property corner on the property line when the other property corner that defines said line is existing or there has been sufficient retracement to define said line. In other cases, place a reference monument (RM) perpendicular to the centerline at the station of the original position and at a distance from the original position measured in whole feet.

Those monuments found that are not shown on the Plans will be recognized by the Engineer when the following is provided by the Surveyor: Field notes identifying type and location of the monument, and a description of the point the monument marks, with the reason to preserve its location. Monuments not shown on the Plans will be considered additional work and paid by Item G-135b, ~~Conditional~~ Extra Three Person Survey Party.

The Surveyor shall complete a State of Alaska Land Survey Monument Record form for each primary and secondary monument referenced, removed, installed, relocated or replaced. Provide the required survey information on the form according to statutory requirements, including section, township and range. Meet requirements for recording at the District Recorder's Office in which the project is located for each monument record. Deliver conforming copies of the recorded forms to the Engineer before monument removal or disturbance, and after setting any final monuments requiring monument records.

Set each monument and monument case accurately to lines established at the required location and in a manner as to ensure being held firmly in place. Set existing monuments and monument cases to be adjusted to new elevations in the manner and at the elevations directed.

Primary Airport Control (PAC) and Secondary Airport Control (SAC) monuments are present in the project area as shown on the Plans. This control is important and if disturbed, must be reestablished by the Contracting Agency. For this reason, the Contractor is required to employ all reasonable measures to preserve the existing control monuments in an undisturbed condition. If any PAC or SAC is disturbed by the Contractor's actions, the Contractor shall reimburse the State of Alaska for the cost of replacing monuments,

performing geodetic surveys and related data processing, and filing the completed survey with the National Geodetic Surveys office. The estimated cost for reestablishing a disturbed monument is approximately $50,000, but costs will vary depending on location, season, availability of staff, and other factors.

135-3.4 OFFICE ENGINEERING. Calculate finish grades for the embankments as specified according to Plans and/or Specifications. Use information available in the field, on as-builts, or as provided by the Engineer. This work shall be performed by or under the responsible charge of a Professional Land Surveyor or a Professional Engineer currently Registered in the State of Alaska.

135-3.5 FINAL TRAVERSE. Within 30 days after the Engineer receives a letter stating that construction activities that may disturb the monuments have ceased, the Surveyor shall run a final closed traverse to verify the positional accuracy of installed survey monuments. Tie into the traverse the primary and secondary monuments placed or replaced and undisturbed Department-provided control points. Meet the requirements of a secondary monument for traverse points established during this work. The Surveyor shall sign and stamp a letter that lists each monument and its coordinates. The letter shall certify that the monuments are each located within 0.1 foot of their proposed position based on the project survey control points provided by the Department. Deliver the certification letter and field notes for this work to the Engineer.

135-3.6 EXTRA THREE PERSON SURVEY PARTY. This pay item is for extra, additional, or unanticipated work made necessary by changes in the project. Work performed under pay item G-135b may include field work, office engineering, or any work described under the construction requirements of item G-135.

135-3.7 FINISH GRADE CHECKING. Perform all survey work required to verify that the finished surface of all asphalt concrete pavement meets the requirements for grade as specified in subsection P-401-5.2, f(4), Grade Acceptance Criteria. Multiple surveys may be necessary in areas that require reworking.

METHOD OF MEASUREMENT

135-4.1 The work will be measured according to Section GCP-90, as directed by the Engineer, and as follows:

- **a.** Lump Sum. No measurement of quantities will be made.
- **b.** Hour. By the number of hours, as directed by the Engineer and as recorded by certified payrolls.
- **c.** Contingent Sum. As specified by the Engineer in the Directive authorizing the work.

BASIS OF PAYMENT

135-5.1 Pay Items include all necessary personnel, equipment, transportation, and supplies to accomplish the work described in the Contract, or as directed by the Engineer.

Pay Item G-135a Construction Surveying by the Contractor, includes all Contractor surveying work described in the Contract.

Pay Item G-135b Extra Three Person Survey Party, includes payment by the hour for extra, additional or unanticipated work made necessary by changes in the project. Adjustment according to GCP-90-04 is not allowed for this pay item. Work accomplished by a three person survey party will be paid at 100% of the contract unit price, by a two person survey party at 75% of the contract unit price, or by a one person survey party at 32% of the contract unit price, for Pay Item G-135b.

Pay Item G-135c Monuments by the Contractor, includes all monument work described in the Contract.

Pay ItemG-135d Extra Surveying by the Contractor, includes payment according to a Directive from the Engineer authorizing the work. This pay item is for extra, additional, or unanticipated work made necessary by changes in the project.

Payment will be made under:

Item G-135a	Construction Surveying by the Contractor - per lump sum
Item G-135b	Extra Three Person Survey Party - per hour
Item G-135c	Monuments by the Contractor - per lump sum
Item G-135d	Extra Surveying by the Contractor – per contingent sum

G-150 EQUIPMENT RENTAL

DESCRIPTION

150-1.1 This item consists of furnishing construction equipment, operated, fueled and maintained, on a rental basis for use in construction of the proposed improvements and in performing work incidental to construction at the direction of the Engineer as such work is generally defined in these Plans and Specifications. Construction equipment is defined as that equipment actually used for performing the items of work specified and shall not include support equipment such as, but not limited to, hand tools, power tools, electric power generators, welders, small air compressors and other shop equipment needed for maintenance of the construction equipment.

REQUIREMENTS

150-2.1 EQUIPMENT FURNISHED. The construction equipment to be provided under this contract shall be that shown in the Special Provisions and/or the bid schedule supplemented by such non-rental maintenance equipment and support equipment as the Contractor elects to provide. The equipment shall be of modern design and in good working condition and shall be maintained in good working condition throughout the life of the project. All equipment to be used in the construction of this project as noted in the Bid Schedule shall be made available for inspection by the Engineer prior to its shipment to the project site. Each item of equipment shall have company numbers clearly displayed for ready identification. The Engineer shall have the authority to prohibit the use of rental payment for any equipment which is not maintained in good working condition or which has a production capacity below construction industry standards.

150-2.2 EQUIPMENT OPERATORS. Equipment operators shall be competent and experienced and shall be capable of operating the equipment to its capacity. The Contractor shall replace those operators who, in the opinion of the Engineer, misconduct themselves, either on the job or in the community, or are incompetent or negligent in the operation of the equipment.

150-2.3 HOURS OF OPERATION AND TIMEKEEPING. The Engineer shall begin recording time for payment each shift when the equipment begins work on the project. Time during which the equipment is being serviced or repaired shall not be included. The stated equipment rental rates shall apply only to that time during which the equipment is actively engaged in construction, as directed by the Engineer. No standby payment will be made for any piece of equipment prior to, during the life of, or after the project has been completed. "Stuck Time" payment shall be made for each piece of equipment that becomes stuck while actively engaged in construction work on the airport and shall be limited to 1 hour per shift for each piece of equipment that becomes stuck.

150-2.4 CONSTRUCTION METHODS. The work shall be constructed according to the Plans, Special Provisions and as directed by the Engineer.

METHOD OF MEASUREMENT

150-3.1 The serial number and brief description of each item of equipment listed in the bid schedule will be recorded by the Engineer, and they will record the number of hours, or fractions thereof to the nearest one-quarter hour, during which the equipment is actively engaged in construction of the project. The furnishing and operating of equipment of heavier type, larger capacity, or higher horsepower than specified will not entitle the Contractor to any extra compensation over their applicable contract unit price. Each day's activity will be recorded on a separate sheet or sheets, which shall be verified and signed by the Contractor's representative at the end of each shift, and a copy will be provided to the Contractor's representative. No idle time will be recorded unless authorized by the Engineer.

BASIS OF PAYMENT

150-4.1 Payment will be made at the contract unit price bid for equipment rental per hour. This payment shall be full compensation for all fuel, operator's and mechanic's wages, parts, tools, maintenance items, shop equipment, camp, camp personnel wages, and all other incidentals necessary to keep the equipment in good condition and available for work on the project. No payment for equipment standby time resulting from unfavorable weather, or any other reason, is implied or intended and no payment therefore will be made by the Department. No payment will be made separately or directly for embankments.

Payment will be made under:

Item G-150a Equipment Rental, 70 HP min - per hour

ITEM G-300 CRITICAL PATH METHOD (CPM) SCHEDULING

DESCRIPTION

300-1.1 Provide and maintain a Critical Path Method (CPM) progress schedule for the project. Use the schedule in coordinating and monitoring of all work under the Contract including activity of subcontractors, manufacturers, suppliers, and utility companies, and reviews by the Department. Update the CPM schedule, as required.

Provide work plans.

SUBMITTAL OF SCHEDULE

300-2.1 Submit a detailed initial CPM Schedule at the pre-construction conference for the Engineer's acceptance as set forth below.

The construction schedule, for the entire project, may not exceed the specified contract time.

Allow the Engineer 14 days to review the initial CPM Schedule. If revisions are required, make them promptly. The finalized CPM Schedule must be completed and accepted prior to commencement of any work on the project.

REQUIREMENTS AND USE OF SCHEDULE

300-3.1

a. **Schedule Requirements.** Prepare the CPM schedule as a Precedence Diagram Network developed in the activity-on-node format which includes:

   (1) Activity description

   (2) Activity duration

   (3) Resources required for each of the project activities, including:

      (a) Labor (showing work days per week, holidays, shifts per day, and hours per shift)

      (b) Equipment (including the number of units of each type of equipment)

      (c) Materials.

   Show on the activity-on-node diagram the sequence and interdependence of all activities required for complete performance of all items of work under this Contract, including shop drawing submittals and reviews and fabrication and delivery activities.

   No activity duration may be longer than 15 work days without the Engineer's approval.

   The Engineer reserves the right to limit the number of activities on the schedule.

   Consider that schedule float time is shared equally with the Department.

   The contract completion time will be adjusted only for causes specified in this Contract.

   As determined by CPM analysis, only delays in activities which affect milestone dates or contract completion dates will be considered for a time extension.

b. **Schedule Updates.** Hold job site progress meetings with the Engineer for the purpose of updating the CPM Schedule. Meet with the Engineer monthly, or as deemed necessary by the

Engineer. Review progress and verify finish dates of completed activities, remaining duration of uncompleted activities, and any proposed logic and/or time estimate revisions. Submit a revised CPM schedule within 5 working days after this meeting showing the finish dates of completed activities and updated times for the remaining work, including any addition, deletion, or revision of activities required by Contract modification.

c. **Work Plans.** In addition to the CPM schedule, submit a work plan every 2 weeks during construction, detailing your proposed operations for the forthcoming two weeks. Include:

(1) Work activities
(2) Manpower involved by trade
(3) Work hours
(4) Equipment involved
(5) Location of the work to be performed

METHOD OF MEASUREMENT

300-4.1 Section 90.

BASIS OF PAYMENT

300-5.1 At the lump sum price for CPM Scheduling.

Payment will be made under:

Item G-300a CPM Scheduling - per lump sum

ITEM G-700 TRAFFIC CONTROL FOR AIRPORTS

DESCRIPTION

700-1.1 Provide suitably equipped airport flagger(s) with no other assigned duties to monitor and control the Contractor's personnel and equipment crossing or occupying any portion of the Air Operations Area of the airport, as required under Section 80-04 Limitation of Operations.

REQUIREMENTS

700-2.1 Furnish airport flaggers and all necessary equipment. Equip each airport flagger assigned to an aircraft operations area with a two-way radio that broadcasts and receives on the designated Common Traffic Advisory Frequency (CTAF) for the project airport as found in the Alaska Supplement of the United States Government Flight Information Publication. Provide each airport flagger with a two-way radio to contact construction equipment and other airport flaggers on the project. Equip each airport flagger for vehicular traffic control with a flagging paddle that conforms to the requirements of the Alaska Traffic Manual.

Locate each airport flagger at a position as shown on the Plans or as described in the Safety Plan, or at an alternate location as directed by the Engineer. Ensure that each airport flagger maintains their assigned post at all times. Airport flagger positions will be adjusted as conditions warrant.

METHOD OF MEASUREMENT

700-3.1 Airport flagger will be measured by the hour for the actual number of hours that each airport flagger performed as directed by the Engineer.

BASIS OF PAYMENT

700-4.1 Payment will be made at the contract unit price for each Airport Flagger per hour. The hourly rate for Airport Flagger is set at $58.00 per hour for this contract. The Engineer does not require a change order/directive for this pay item.

Payment will be made under:

Item G-700a Airport Flagger - per contingent sum

ITEM G-710 TRAFFIC CONTROL FOR ROADS, STREETS, AND HIGHWAYS

710-1.1 DESCRIPTION. Protect and control traffic during the contract. Furnish, erect, maintain, replace, clean, move and remove the highway traffic control devices required to ensure the public's safety. Perform all administrative responsibilities necessary to implement this work.

Maintain all public corridors affected by the work in a smooth and passable condition. Construct and maintain approaches, crossings, intersections, and other necessary features throughout the project for the life of the contract.

710-1.2 ACRONYMNS AND DEFINITIONS.

ATM. When used in this section, ATM stands for the *Alaska Traffic Manual*, which is the MUTCD with the *Alaska Traffic Manual Supplement*.

HIGHWAY. A main direct road. Used throughout this section for the sake of brevity, the word "highway" also applies to roads and streets.

HIGHWAY TRAFFIC CONTROL ZONE. A portion of a construction project, haul route, utility work, or similar operation that affects traffic and requires highway traffic control to safely guide and protect motorists, pedestrians, bicyclists, or workers, outside of the AOA.

HIGHWAY TRAFFIC CONTROL PLAN (TCP). A drawing or drawings indicating the method or scheme for safety 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.

TRAFFIC. The movement of vehicles, ATV's, equipment, pedestrians, and bicyclists through public corridors, construction areas, utility work, or similar operations.

710-1.3 HIGHWAY TRAFFIC CONTROL PLAN. Design and implement an approved TCP before beginning work within a highway traffic control zone.

The TCP includes, but is not limited to, signs, barricades, traffic cones, plastic safety fence, special signs, warning lights, highway flaggers, temporary lighting, temporary roadways and all other items required to direct traffic through or around the highway traffic control zone according to these Specifications and the ATM. Address in the TCPs, placement of highway traffic control devices, including location, spacing, size, mounting height and type. Include code designation, size, and legend per the ATM and the ASDS.

When a TCP is included in the Plans, use it, modify it, or design an alternative TCP. When a TCP is omitted from the Plans, provide one according to this Section and the ATM.

Submit new or modified TCPs to the Engineer for approval. Allow 1 week for the Engineer to review any TCP or each subsequent correction. You may change an approved TCP during construction provided you allow 48 hours for review and the Engineer approves the changes.

Certify by signature of the Worksite Traffic Supervisor that all TCPs conform with the ATM and Specifications. The Engineer will not accept the TCP without Worksite Traffic Supervisor's certification. Have your superintendent review and sign all TCPs before you submit them.

In all TCPs you submit, include the periods for which the TCP will be in effect. Provide the name and 24-hour telephone number of the Worksite Traffic Supervisor.

The TCPs, Plans, and Standard Drawings show the minimum required number of highway traffic control devices. If unsafe conditions occur, the Engineer may require additional highway traffic control devices.

Use of equipment in a highway traffic control zone must conform to an approved TCP, including all highway traffic control devices these operations require.

Rural projects that are off the NHS and the Alaska Highway System require a waiver per 17 AAC 25.800 to operate oversize and overweight vehicles ~~outside the project limits~~ off of airport property.

710-1.4 WORKSITE TRAFFIC SUPERVISOR. Provide a Worksite Traffic Supervisor responsible for maintaining 24-hour traffic operations.

a. Qualifications. Ensure the Worksite Traffic Supervisor understands ATM requirements, the Plans, the Specifications, your proposed operations, and is certified as one of the following:

(1) Worksite Traffic Supervisor certified by the American Traffic Safety Services Association (ATSSA).

(2) Level One Signs and Markings Specialist certified by the International Municipal Signal Association (IMSA).

Item (2) requires documentation of at least 12 months of supervisory-level worksite highway traffic control or 12 months of responsible charge of such work. "Responsible charge" means that the Worksite Traffic Supervisor has been accountable for selecting devices and placing them in the highway traffic control system, or for continued system operation. The Worksite Traffic Supervisor satisfies this requirement if they have supervised persons performing this labor.

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

b. Duties.

(1) Prepare the TCPs and public notices and coordinate highway traffic control operations between the Project Superintendent and the Engineer.

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

(3) Supervise the repair or replacement of damaged or missing highway traffic control devices.

(4) Review and anticipate highway traffic control needs. Make available proper highway traffic control devices necessary for safe and efficient traffic movement.

(5) Review work areas, equipment storage, and traffic-safety material handling and storage.

(6) Hold traffic safety meetings with superintendents, foremen, subcontractors, and others as appropriate before beginning construction, prior to implementing a new TCP, and as directed. Invite the Engineer to these meetings. Conduct monthly open house public meetings to discuss the TCP and construction phasing.

(7) Supervise all highway traffic control workers and highway flaggers.

(8) Certify that all highway flaggers are certified as required by subsection 710-3.4c. Submit a copy of all highway flagger certifications to the Engineer.

MATERIALS

710-2.1 Provide highway traffic control devices meeting the following requirements:

a. **Signs.** Use signs, including sign supports, that conform to Section P-661, the ATM, the ASDS, and AASHTO M 268. Make orange background signs from sheet aluminum, and use Type II or Type III orange reflective background sheeting on projects advertised before 1/01/2007, or use Type VIII or Type IX fluorescent orange reflective background sheeting at any time.

   (1) **Construction Signs:** Regulatory, guide, or construction warning signs designated in the ASDS.

   (2) **Permanent Construction Signs:** As designated on the Plans or an approved TCP.

   (3) **Special Construction Signs:** All other signs are Special Construction Signs. Neatly mark the size of each sign on its back in 3-inch black numerals.

b. **Portable Sign Supports.** Use wind-resistant sign supports with no external ballasting. Use sign supports that can vertically support a 48 X 48 inch highway traffic control sign at the height above the adjacent roadway surface required by the ATM.

c. **Barricades and Vertical Panels.** Use barricades and vertical panel supports that conform to the ATM. Use Type III Barricades at least 8 feet long. Use reflective sheeting that meets AASHTO M 268 Type II or III.

d. **Warning Lights.** Use Type A (low intensity flashing), Type B (high intensity flashing) or Type C (steady burn) warning lights that conform to the ATM.

e. **Drums.** Use plastic drums that conform to the requirements of the ATM. Use reflective sheeting that meets AASHTO M 268 Type II or III.

f. **Traffic Cones and Tubular Markers.** Use reflectorized traffic cones and tubular markers that conform to the requirements of the ATM. Use traffic cones and tubular markers at least 28 inches high. Use reflective sheeting that meets AASHTO M 268 Type II or III.

g. **Plastic Safety Fence.** Use 4 foot high construction orange fence manufactured by one of the following companies, or an approved equal:

   (1) "Safety Fence" by Services and Materials Company, Inc., 2200 South "J" Street, Elwood, Indiana, 46036. Phone (800) 428-8185.

   (2) "Flexible Safety Fencing" by Carsonite, 1301 Hot Springs Road, Carson City, Nevada, 89706. Phone (800) 648-7974.

   (3) "Warning Barrier Fence" by Plastic Safety Systems, Inc. P.O. Box 20140, Cleveland, Ohio, 44120. Phone (800) 662-6338.

h. **Flagger Paddles.** Use flagger paddles with 24 inches wide by 24 inches high sign panels, 8 inch Series C lettering (see ASDS for definition of Series C), and otherwise conform to the ATM. Use reflective sheeting that meets AASHTO M 268 Type VIII or IX. Use background colors of fluorescent orange on one side and red on the other side.

710-2.2 CRASHWORTHINESS. Submit documentation, that all highway traffic control devices conform to the requirements of National Cooperative Highway Research Program (NCHRP) Report 350 (Test Level 3).

CONSTRUCTION METHODS

710-3.1 GENERAL CONSTRUCTION REQUIREMENTS. Keep the work, and portions of the project affected by the work, in good condition to accommodate traffic safely. Provide and maintain highway traffic control devices and services ~~inside and outside the project limits~~ on and off of airport property within the highway traffic control zone, day and night, to guide traffic safely.

Unless otherwise provided in this Section, keep all roadways, business accesses, and pedestrian facilities open to traffic. Obtain the Engineer's approval before temporarily closing residential, commercial, or street approaches. Provide access through the project for emergency vehicles and school and transit buses. Properly sign and/or flag all locations where you must redirect or stop the traveling public.

Stop your equipment at all points of intersection with the traveling public unless an approved TCP shows otherwise.

Operate flood lighting at night according to the ATM. Adjust flood lighting so that it does not shine into oncoming traffic.

Provide and maintain safe routes for pedestrians and bicyclists through or around highway traffic control zones at all times, except when regulations prohibit pedestrians or bicyclists.

Immediately notify the Engineer of any traffic related accident that occurs ~~within the project limits~~ within the highway traffic control zone as soon as you, an employee, or a subcontractor becomes aware of the accident.

710-3.2 ROADWAY CHARACTERISTICS DURING CONSTRUCTION. Obtain an approved TCP before reducing existing roadway lane and shoulder widths before starting construction. Maintain a clear area with at least 2 feet between the edge of traveled way and the work area. Use barricades, traffic cones, or drums to delineate this area. Place highway traffic control devices on the work side of the clear area. Space them according to the ATM.

If you are allowed to maintain traffic on an unpaved surface, conduct construction to provide a smooth and even surface that public traffic can use at all times. Properly crown the roadbed surface for drainage. Before beginning other grading operations, place sufficient fill at culverts and bridges to permit traffic to cross smoothly and unimpeded. Use part-width construction techniques when routing traffic through roadway cuts or over embankments under construction. Excavate the material or place it in layers. Alternate construction activities from one side to the other. Route traffic over the side opposite the one under construction.

You may detour traffic when the Plans or an approved TCP allows it. Maintain detour routes so that traffic can proceed safely. When detours are no longer required, obliterate the detour. Topsoil and seed appropriate areas.

If you cannot maintain two-way traffic on the existing roadway or detour, you may use half-width construction or a road closure if it is shown on an approved TCP. Make sure the TCP indicates closure duration and conditions. Schedule roadway closures so you do not delay school buses and peak-hour traffic. For road closures, post closure-start and road-reopen times at the closure site, within view of waiting traffic.

710-3.3 PUBLIC NOTICE. Make sure the Worksite Traffic Supervisor gives notices of major changes, delays, lane restrictions, or road closures to local officials and transportation organizations, including but not necessarily limited to:

- **a.** Local Police Department
- **b.** Local Fire Department
- **c.** Local Government
- **d.** School and Transit Authorities
- **e.** Local Emergency Medical Services
- **f.** Local Media (newspapers, radio, television)
- **g.** U.S. Postal Service

h. Major Tour Operators

710-3.4 HIGHWAY TRAFFIC CONTROL DEVICES. Before starting construction, erect permanent and temporary highway traffic control devices required by the approved TCPs. Use highway traffic control devices only when they are needed. The Engineer will determine advisory speeds when necessary.

During hours of darkness when required by the approved TCP use flashing warning lights to mark obstructions or hazards and steady-burn lights for channelization.

Use only one type of highway traffic control device in a continuous line of delineating devices, unless otherwise noted on an approved TCP. Use drums or Type II barricades for lane drop tapers.

During non-working hours and after completing a particular construction operation, remove all unnecessary highway traffic control devices. Store all unused highway traffic control devices in a designated storage area, which does not present a nuisance or visual distraction to traffic. If sign panels are post mounted and cannot be readily removed, cover them entirely with either metal or plywood sheeting.

Keep signs, drums, barricades, and other devices clean at all times.

Use only highway traffic control devices that meet the requirements of the "Acceptable" category in ATSSA "Quality Standards for Work Zone Traffic Control Devices".

Immediately replace any devices provided under this Section that are lost, stolen, destroyed, inoperable or deemed unacceptable while used on the project.

All items paid under this Section remain your property unless otherwise stated. Remove them after completing the project.

a. Embankments. Install plastic drums, barricades, tubular markers, plastic safety fence, and cones as specified on the Plans or TCPs to delineate open trenches, ditches, other excavations and hazardous areas when they exist along the roadway for more than one continuous work shift.

b. Fixed Objects. Use flashing warning lights on all vehicles when they are working within 15 feet of the edge of traveled way. Use emergency flashers, flashing strobes or rotating beacons.

Locate private vehicles, idle construction equipment, construction material stockpiles and other items deemed by the Engineer to be fixed objects at least 30 feet from the edge of traveled way at all times. Do not park equipment in medians.

If you cannot meet the preceding restrictions because of land features or lack of right-of-way, park equipment as far away as practical but at least 15 feet from the edge of traveled way, as approved by the Engineer. Use drums or Type II barricades with flashing warning lights to delineate parked equipment. These highway traffic control devices are subsidiary.

c. Highway Flagger. Furnish trained and competent highway flaggers and all necessary equipment, including lighting of the highway flagger position during nighttime operations, to control traffic through the highway traffic control zone. The Engineer will approve each highway flagger operation before it begins and direct adjustments as conditions change.

Highway flaggers must be certified by one of the following:

(1) Flagging Level I Certification by IMSA
(2) Flagger Certification by ATSSA

Acceptable substitutions for items (1) and (2) are certified ATSSA Worksite Traffic Supervisors, IMSA Work Zone Traffic Safety Specialists, IMSA Signs and Markings Specialists and ATSSA Flagger Instructors.

Renew highway flagger training and certification no less frequently than every 4 years. Highway flaggers must be able to show their flagger certification anytime they are on the project.

Highway flaggers must maintain their assigned posts at all times, unless another qualified highway flagger relieves them, or you no longer need to flag traffic. Remove, fully cover, or lay down flagger signs when no highway flagger is present. Keep the highway flaggers' area free of encumbrances, such as parked vehicles, so that highway flaggers can be seen easily.

Provide approved equipment for two-way radio communications between highway flaggers when they are not in plain, unobstructed view of each other.

d. **Watering.** Furnish, haul, and place water for dust control, as directed. Use water trucks that can provide a light-water spray to control dust. The Engineer will control water application.

   If you take water from a lake, stream, or other natural water body, first obtain a water removal permit from the Alaska Department of Natural Resources. Comply with the Alaska Department of Fish and Game screening requirements for all water removal operations.

710-3.5 AUTHORITY OF THE ENGINEER. When the Engineer believes existing conditions may adversely affect the traveling public's safety and/or convenience, you will receive a written notice. The notice will state the defect(s), the corrective action(s) required, and the time required to complete such action(s) not to exceed 24 hours. If you fail to take corrective action(s) within the specified time, the Engineer will immediately close down the offending operations until you correct the defect(s). The Engineer may require outside forces to correct unsafe conditions. The cost of work by outside forces will be deducted from any monies due under the terms of this Contract.

710-3.6 HIGHWAY TRAFFIC PRICE ADJUSTMENT. A Highway Traffic Price Adjustment, under Item G-710c, will be assessed for unauthorized lane closures or lane reductions. Highway Traffic Price Adjustments are liquidated damages representing highway user costs. The Highway Traffic Price Adjustment Rate is a deduction from the Contract amount of $30 per minute for unauthorized lane closure or lane reduction, per lane.

Authorized lane closures and/or lane reductions are those shown in the Contract, an approved TCP, or authorized in writing. Unauthorized lane reductions include unacceptable driving surfaces, such as severe bumps, ruts, washboarding, potholes, excessive dust or mud, and non-conforming, dirty, or out of place highway traffic control devices. The Engineer will make the sole determination as to whether the roadway, trail, or pedestrian facility is acceptable for full unimpeded use by the public. Failure to maintain an acceptable infrastructure or highway traffic control plan will result in a price adjustment equal to 100 percent of the Highway Traffic Price Adjustment Rate, for the time the roadway, trail, or pedestrian facility is in an unacceptable condition.

710-3.7 MAINTENANCE OF TRAFFIC DURING SUSPENSION OF WORK. Approximately one month before you suspend work for the season, schedule a preliminary meeting with the Engineer to outline the work you expect to complete before shutdown and the anticipated roadway condition. Schedule a field review with the Department for winter maintenance acceptance. At the field review the Engineer will prepare a punch list for implementation before acceptance.

To be relieved of winter maintenance responsibility, leave all roads with a smooth and even surface for public use at all times. Properly crown the roadbed surface for drainage and install adequate safety facilities.

After the project is accepted for winter maintenance and until you are ordered to resume construction operations, the Department is responsible for maintaining the facility. The Department will accept

maintenance responsibility only for portions of the work that are open to the public, as determined by the Engineer. The Department will not accept maintenance responsibility for incomplete work adjacent to accepted roads. You are responsible for maintaining all other portions of the work. The Engineer will issue a letter of "Acceptance for Winter Maintenance" that lists all portions of the work that the Department will maintain during a seasonal work suspension. You retain all contractually required maintenance responsibilities until you receive this letter.

If you suspend work due to unfavorable weather (other than seasonal) or due to your failure to correct unsafe conditions, carry out Contract provisions, or carry out the Engineer's orders, you must bear all costs for highway traffic maintenance during the suspended period.

When you resume work, replace or renew any work or materials lost or damaged during temporary use. If the Department caused damage during winter suspension, payment will be made for repairs by unit pay item or in accord with Subsection GCP-90-05, Compensation for Extra Work. When the Engineer directs, remove any work or materials used in the temporary maintenance. Complete the project as though work has been continuous.

710-3.8 CONSTRUCTION SEQUENCING. The construction sequencing is detailed in these provisions, the Special Provisions, and the Plans. You may propose alternative construction sequencing.

Throughout the project, maintain the existing roadway configuration (such as the number of lanes and their respective widths) except for restrictions to traffic allowed in the Special Provisions or on the Plans, and addressed through approved TCPs. A restriction to traffic is any roadway surface condition, work operation, or highway traffic control that reduces the number of lanes or impedes traffic. Obtain an approved TCP before restricting traffic.

Obtain the local school bus schedule and coordinate your work to ensure the school buses are not delayed through the highway traffic control zone. Submit this plan, as a TCP, to the Engineer for approval before implementation.

710-3.9 INTERIM PAVEMENT MARKINGS – RESERVED.

710-3.10 LIGHTING OF NIGHT WORK – RESERVED.

710-3.11 HIGH VISIBILITY GARMENTS. Ensure all workers within ~~project limits~~ the highway traffic control zone wear outer garments that are highly visible and comply with the following requirements:

a. **Tops.** Wear fluorescent orange-red vests, jackets, or coverall tops at all times. Furnish each vest, jacket and coverall top with at least one 360-degree horizontal retroreflective band around the torso; and with two vertical retroreflective bands that begin at the horizontal band or lower in front, reach over the shoulder, and end at the horizontal band or lower in back. Furnish each jacket and coverall top with two horizontal retroreflective bands on each sleeve; one above and one below the elbow.

b. **Bottoms.** Wear fluorescent orange-red pants or coverall bottom during nighttime work (sunset to sunrise). Worksite traffic supervisors, employees assigned to highway traffic control duties, and flaggers wear fluorescent orange-red pants or coverall bottom at all times. Furnish each pants or coverall bottom with two horizontal retroreflective bands on each leg.

c. **Raingear.** Raingear tops and bottoms, when worn as the outer visible garment, conform to the requirements listed in this Subsection 710-3.11.

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

e. **Standards.** All high visibility garments conform to the requirements of ANSI/ISEA 107-2004, Class 2 for tops or Class E for bottoms, and Level 2 retroreflective material.

Retroreflective bands are made of material conforming to either:

(1) A two inch wide strip, fluorescent yellow-green color, made of retroreflective microprisms; or

(2) A two inch wide strip, silver color, made of retroreflective lenses bonded to a durable cloth backing; and on two long edges apply one inch wide strips, fluorescent yellow-green color, made of durable cloth material. Total width of band is 4 inch.

f. Labeling. Garments are labeled in conformance with Section 11.2 of ANSI/ISEA 107-2004; except you may use garments labeled in conformance with ANSI/ISEA 107-1999 until 1/1/08.

g. Condition. Furnish and maintain all vests, jackets, coveralls, rain gear, hard hats, and other apparel in a neat, clean, and presentable condition. Maintain retroreflective material to Level 2 standards.

h. Subsidiary. Payment for high visibility garments for workers is subsidiary to other items.

710-3.12 OVERSIZE AND OVERWEIGHT VEHICLES. Comply with the legal size and weight regulations of 17 AAC 25 and all restrictions of the *Administrative Permit Manual*, except when the Department waives the requirements.

The engineer ~~may~~ will waive the permit requirements of regulation 17 AAC 25 regarding oversize and overweight vehicles ~~within the project limits when~~ provided that the contractor submits and follows an ~~acceptable~~ approved Highway Traffic Control Plan.

~~Permits shall be obtained from the Department's Division of Measurement Standards & Commercial Vehicle Enforcement, for movements of oversize and overweight equipment outside of the project limits, except when the Department waives the permit requirements outside of the project limits. Retain this permit for your records and submit a copy to the Engineer.~~

Submit a highway traffic control plan for hauling operations from the material site(s) to the project. Include all the highway traffic control devices required for these operations in the highway traffic control plan. Indicate the type, number and frequency of oversize and overweight hauling equipment.

The following items are required of oversize or overweight vehicles or equipment:

a. Truck and equipment headlights must be on at all times during vehicle use;

b. A roof mounted flashing or rotating amber beacon, visible from 360 degrees, must be on during vehicle use;

c. For overweight street legal vehicles, mount clearly visible oversize signs on front and rear of vehicle; and

d. For oversize equipment and/or overweight non-street legal equipment, mount 16" X 16" clean red/orange flags on the outboard points, in addition to clearly visible oversize signs on front and rear of equipment.

When oversize or overweight vehicles are used, add the following to the Highway Traffic Control Plan:

a. Install and maintain orange plastic safety fence that separates the haul route from any adjacent school, business, residence, community center or public gathering place;

b. Furnish highway flaggers as specified by the Highway Traffic Control Plan, and at additional locations where necessary, to control the haul route during all hauling operations. Coordinate their

placement with the Engineer. Haul route highway flaggers will be in addition to airport flaggers required by FAA Advisory Circular150/5370-2E, and the Construction Safety Plan;

c. Limit haul unit speed to 10 mph when passing through any developed area or significant hazard. The Engineer is sole judge of what constitutes a developed area or significant hazard;

d. Obey bridge load restrictions and all height restrictions on haul route;

e. Maintain the haul route in a smooth and dust free condition. Remove all haul debris from the roadway and the surroundings;

f. When overweight loads are hauled over existing pavement, remove the existing pavement and replace with new pavement of similar material and equal thickness to old pavement, as a subsidiary cost, after the haul is finished;

g. Hauler is responsible for the costs of repair for damage to the highway structures, including but not limited to the bridge railings, guardrail, light poles, signs, signal, highway traffic control devices, utilities, and mailboxes on the roadways;

h. Immediately reinstall all signs, signals, guardrail and other safety features that were removed for the haul; and

i. If mailboxes were removed for the haul, reinstall mailboxes by the next day after the haul.

j. Maintain a minimum 12 foot lateral separation between the nonstreet legal vehicles and the motoring public. Specify the highway traffic control devices required for these operations in the highway traffic control plan.

METHOD OF MEASUREMENT

710-4.1 Section GCP-90 and as follows. Quantities will not be measured during winter suspension of work.

a. Highway Traffic Control Device Items. By the number of units in the Highway Traffic Control Rate Schedule, under item G-710d Highway Traffic Control that are installed, accepted, and operational. Incomplete or unsatisfactory devices will not be measured. Special Construction Signs are measured by the total area of legend-bearing sign panel, as determined under subsection P-661-4.1. Items measured by the day are for each item per 24-hour period.

b. Highway Flagger. By the number of approved hours, supported by certified payroll.

c. Watering. By the 1,000 gallons (M-Gallon) of water applied. The Engineer may specify measurement by weight or volume. If by weight, convert to gallons at 8.34 pounds per gallon. If by volume, convert to gallons at 7.48 gallons per cubic foot.

d. Highway Traffic Price Adjustment. By each minute of unauthorized lane closure or lane reduction, per lane, measured to the nearest minute. The Engineer will determine whether the roadway is opened to full unimpeded use by the traveling public.

e. Highway Traffic Control. By the units specified.

f. Plastic Safety Fence. By the linear foot, as placed, to protect or channelize pedestrian traffic as shown on an approved TCP. Any adjustments in configuration of the fence at the same location that does not result in an increased amount of fence is not measured. Opening and closing the fence to gain access to and from the worksite is not measured.

g. Temporary Guardrail. By the linear foot, including end treatments, as shown on an approved TCP.

BASIS OF PAYMENT

710-5.1 Use the following table for unit rates of pay for Contingent Sum:

HIGHWAY TRAFFIC CONTROL RATE SCHEDULE

Highway Traffic Control Device	Pay Unit	Unit Rate
Construction Signs	Each/Day	$5.00
Special Construction Sign	Square Foot	$20.00
Type II Barricade	Each/Day	$3.00
Type III Barricade	Each/Day	$10.00
Traffic Cone or Tubular Marker	Each/Day	$1.00
Drums	Each/Day	$3.00
Watering	M-Gallon	$20.00
Plastic Safety Fence	Foot	$2.50
Temporary Sidewalk Surfacing	Square Foot	$1.15
Flexible Markers	Each	$50.00
Temporary Guardrail	Foot	$21.00

a. **Highway Traffic Maintenance.** The contract price includes all resources required to provide the Worksite Traffic Supervisor, all required TCPs and public notices, monthly open house meetings, the Construction Phasing Plan, and the maintenance of all roadways, approaches, crossings, intersections and pedestrian and bicycle facilities, as required. This item also includes any Highway Traffic Control Devices required but not shown on the bid schedule.

   Items required by the Contract that are not listed on the bid schedule or not included in other items are subsidiary to Item G-710a Highway Traffic Maintenance, except Highway Traffic Price Adjustment.

b. **Highway Traffic Control Device Items.** The contract price in the Highway Traffic Control Rate Schedule includes all resources required to provide, install, maintain, move, and remove the specified devices. Warning lights, vertical panels, and sign supports required for highway traffic control devices are subsidiary.

c. **Highway Flagger.** The contract price includes all required labor, radios, flagger paddles, and transportation to and from the worksite. The Engineer will pay for item G-710b Highway Flagger at the contract unit price for each Highway Flagger per hour. The hourly rate for Highway Flagger is set at ~~$38.00~~$48.00 per hour for this contract. The Engineer does not require a change order/directive for this pay item. Additional flagging added by change order will be paid according to subsection 40-02 Changes.

d. **Watering.** The contract price in the Highway Traffic Control Rate Schedule includes all resources required to provide watering, as directed.

e. **Highway Traffic Price Adjustment.** If Item G-710c, Highway Traffic Price Adjustment, is shown on the bid schedule, the total value of this contract will be adjusted, for unauthorized lane closures or lane reductions at the rate stated as a pay deduction.

f. **Highway Traffic Control.** Payment for Item G-710d Highway Traffic Control will be made at the unit rate value contained in the Highway Traffic Control Rate Schedule for the accepted units of highway traffic control devices. The Engineer does not require a change order/directive for this pay item.

g. **Plastic Safety Fence.** The contract price in the Highway Traffic Control Rate Schedule includes all resources required to install, maintain, and remove the fence.

h. **Temporary Sidewalk Surfacing.** The contract price in the Highway Traffic Control Rate Schedule includes all resources required to construct, maintain, and remove the surfacing.

i. **Temporary Guardrail.** The contract price in the Highway Traffic Control Rate Schedule includes all resources required to construct, maintain, and remove the guardrail.

Payment will be made under:

Item G-710a	Highway Traffic Maintenance – per lump sum
Item G-710b	Highway Flagger – per contingent sum
Item G-710c	Highway Traffic Price Adjustment – per contingent sum
Item G-710d	Highway Traffic Control – per contingent sum

ITEM L-100 RUNWAY AND TAXIWAY LIGHTING

DESCRIPTION

100-1.1 This item consists of furnishing and installing runway and taxiway lighting systems as indicated on the Plans and as specified herein.

EQUIPMENT AND MATERIALS

100-2.1 GENERAL. Obtain approval of all materials and equipment to be used or incorporated in the work, prior to their shipment to the project site. Submit to the Engineer 5 complete listings of materials and equipment specified herein and on the Plans. Clearly identify the material or equipment by item, name, or designation used on the Plans or specifications and indicate where specified. Include applicable catalog numbers, cuts, wiring diagrams, performance data, and operation and maintenance manuals. Neatly bind and clearly index the submittals. In addition, when specified, include in the submittals certificates of compliance, manufacturer's instructions and/or shop drawings, or proposed construction or installation procedures.

a. **Certified Airport Lighting Equipment.** The following items shall conform to the applicable FAA specifications, except as shown on the Plans and/or modified herein. The equipment shall be certified and listed under AC 150/5345-53, Airport Lighting Equipment Certification Program. This AC, the latest certified equipment list, and the address list of certified airport lighting equipment manufacturers are available on the Internet page for the FAA Office of the Associate Administrator for Airports (ARP). The internet address is http://www.faa.gov/airports_airtraffic/airports/construction/.

ITEM	FAA AC 150/
(1) **Constant Current Regulator, L-828,** class, style, and size as indicated on Plans, 60 Hz input, with brightness control for remote operation.	5345-10
(2) **Runway Edge Light, Bi-directional High-Intensity, L-862,** and Threshold Light, L-862E, with lamp, support column, metal frangible coupling, stainless steel bolts, and upper plug and cord assembly. The lens shall be clamp band style. Complete with lens coloration, lamp wattage, and specified support column height.	5345-46
(3) **Runway Edge Light, Medium Intensity, L-861,** and Threshold Light, L-861E, with incandescent 6.6 A lamp and Lexan lens with support column, metal frangible coupling with stainless steel hex head set screws, and upper plug and cord assembly with separable connector and stainless steel lens encircling clamp band. Complete with lens coloration, lamp wattage, and specified support column height.	5345-46
(4) **Taxiway Edge Light, Medium Intensity, L861T**, with incandescent 6.6 A lamp and Lexan lens, with support column, metal frangible coupling with stainless steel hex head set screws, and upper plug and cord assembly with separable connector and stainless steel lens encircling clamp band.	5345-46
(5) **Airport Signs, L-858,** internally lighted.	5345-44
(6) **Airport Signs, L-858,** unlighted.	5345-44
(7) **Airport Light Base, L-867,** transformer housing, Class I, Size B or D, 24 inches deep, one piece with internal grounding lug, gasket, steel cover, base extension, drain opening, and conduit.	5345-42

(8) **Airport Light Base, L-867,** Watertight, transformer housing, shall be 12 inch x 24 inch, non-steel light bases, meeting the requirements for non-vehicle loading light bases, type L-867. The bases shall be made from Type III, ultra-high molecular weight, heavy-wall, high-density polyethylene pipe having a cell classification of 345434C or better according to ASTM D 3350. A conduit stub made of the same material as the light bases shall be sidewall fused to the bases using saddle fittings, or other approved method for a watertight connection. 5345-42

(9) **Airport Light Base, L-868,** transformer housing, Class I, Steel, Size B, 12 inches deep , two section light base assembly with grooved and "O" ringed flange ring with concrete ring. Complete with any necessary spacer rings, internal grounding lug, mud plate, anti-rotational fins and conduit hubs. 5345-42

(10) **Isolating Transformer, L-830,** individual lamp type, series-to-series, 5000 V, 6.6 A to 6.6 A, 30/45 W or 200 W 5345-47

(11) **Isolating Transformer, L-830,** individual lamp type, series-to-series, 5000 V, 20 A to 6.6 A, 100 W, 200 W or 300 W. Transformers shall have leads of the length shown on the plans. 5345-47

(12) **Isolating Transformer, L-830-1,** individual lamp type, series-to-series, 5000 V, 6.6 A to 6.6 A, 30/45 W. 5345-47

(13) **Isolating Transformer, L-830-6,** individual lamp type, series-to-series, 500 V, 6.6 A to 6.6 A, 200 W. 5345-47

(14) **Radio Control Equipment, L-854,** Type I, with enclosure for surface mounting, antenna and feedline and set to the Common Traffic Advisory Frequency (CTAF) for the project airport as found in the Alaska Supplement of the U.S. Government Flight Publication. 5345-49

(15) **Flush Taxiway Centerline Light Fixture,** Uni or Bi-Directional, Type L-852A, or L-852B, Class 2, Mode 1, Style 3, a flat fixture with 1/4 inch or less clearance above finish surface, with 30 W lamps and color filters, plug and cord assembly, 1/2 inch watertight connector, stainless steel bolts, vibration proof fasteners, "Dry" system with the optical assembly sealed above and below with "O" rings . 5345-46

(16) **Flush Runway Light Fixture,** Uni or Bi-Directional, Type L-850A or L-850B, Class 2, Mode 1, Style 3, as indicated, with 1/4 inch or less clearance above finish surface, with 80 W lamps, color filters, a single 100 or 200 W transformer, plug and cord assembly, 1/2-inch watertight connector, stainless steel bolts, vibration proof fasteners, "Dry" system with the optical assembly sealed above and below with "O" rings. 5345-46

(17) **Primary Handhole, L-868,** class 1, size B, steel, 24 inches deep x 12 inches diameter, 1-3/8 inch N.P.T. conduit hubs (with number and location of hubs as indicated, 4 inch bottom drain hole, steel cover and gasket, internal ground lug with connector and other misc. items. Handhole and cover shall be suitable for vehicle and aircraft wheel loading. 5345-42

(18) **Wind Cone Primary Handhole, L-867,** class 1, size D, steel, 24 inches deep x 16 inch diameter, one piece with internal ground lug with connector, steel cover with gasket, 4 inch drain hole, 2-1/8 inch N.P.T. and 1-3/8 inch N.P.T. conduit hubs with number and location of hubs indicated, and other misc. items. 5345-42

(19) **Handhole, L-867, Size B, Watertight,** transformer housing shall be 12 inch x 24 inch, non-steel light bases, meeting the requirements for non-vehicle loading light bases, type L-867, with ½ inch galvanized steel cover and gasket. The bases shall be made from Type III, ultra-high molecular weight, heavy wall, high density polyethylene pipe having a cell classification of 345434C or better according to ASTM D 3350. A conduit stub made of the same material as the light bases shall be sidewall fused to the bases using saddle fittings, or other approved method for a watertight connection. 5345-42

b. **Sealer.** Adhesive sealant shall be a self-leveling silicone sealer.

c. **Transformer Support Platform.** When called for on the Plans, light bases equipped with L-830 type isolating transformers shall, in addition to the other specified items, be provided with 13-3/4 inch high prefabricated steel, fixed height or folding type, transformer support platforms as shown on the Plans.

d. **Power Adapter.** Power adapter, when called for in the plans shall be a series primary to 120 V regulated-voltage power supply suitable for use with a 3-step constant current regulator source. The power adapter shall be oil filled and include two replaceable internal fuses. Power adapter ratings shall be 670 VA at 120 V ac with ± 3% regulation @ 2.8 to 6.6 A primary current.

e. **Regularly Used Commercial Items.** All other regularly used commercial items of electrical equipment not covered by FAA equipment specifications shall conform to the applicable NEMA rulings and standards for equipment of its type.

f. **Lock Washers.** Lock washers shall be two piece cam-type lock washer.

g. **Free Flowing Insulating Material.** Insulating material for filling of light bases shall be an inorganic, non-flammable, free-flowing granular material. The material shall be chemically treated to be hydrophobic. It shall be free of asbestos. The material shall have a density of 40 to 42 lb/ft3, and a load bearing strength of 83 psi.

h. **Lubricant and Sealant.** Lubricant and sealant shall be a general purpose "O"-ring and valve lubricant. Temperature range shall be -40 °F to +400 °F.

i. **Soft Gasket.** Gaskets to be installed between the base plate and base in watertight lighting systems shall be soft neoprene.

j. **Pedestals.** The power and communications pedestals shall be fiberglass enclosures constructed to meet the requirements of ANCI C 57.12.28 Standard for Pad-mounted Equipment Enclosure Integrity, an attachment to ANSI C 37.72. Construction details and overall dimensions shall be according to the Plans.

k. **Junction Box, Type II.** Junction boxes shall be pre-cast reinforced concrete boxes of the size and details shown on the Plans. Junction boxes shall have metal covers. The covers shall be effectively grounded with a 3-foot copper braid.

l. **Concrete.** Conform to Item P-610 Structural Portland Cement Concrete, 1-inch maximum size coarse aggregate.

CONSTRUCTION METHODS

100-3.1 GENERAL. All work in connection with the airport lighting system shall be according to the applicable provisions of the current NEC of the National Fire Protection Association and all State and local codes. Location of all new fixtures, conduit, cables, etc., shall be as shown on the Plans.

Level and align light fixtures according to manufacturer's instructions. Level to within 1 degree. Align to within 1/2 inch at right angles to centerline and to within 1 inch parallel to centerline.

Where electrical cable or duct is required, such work will be covered under Item L-108 or L-110, as applicable.

Where remote relay assembly and/or remote control panel is required, such work will be covered under item L-109.

Provide all labor, materials, systems, equipment, facilities, and other incidental items as may be required to provide temporary electrical power for construction and testing of all contract work.

100-3.2 INSTALLATION OF NON-WATERTIGHT EDGE LIGHTS. The light base shall be placed on a layer of bedding material of minus 1/4 inch material that is not less than 6 inches in depth. Bedding material shall be, sand, gravel, crushed aggregate, or other suitable material containing no organic, frozen, or other deleterious material. If the light base is placed in the structural section (P-154, P-208, P-209) of a pavement such as for a runway or taxiway, the Contractor shall construct the backfill according to the specifications for the material in which the duct is placed. The material shall be compacted to the requirements of the material into which it is placed. The light base shall be placed to between 3/8 inch and 3/4 inch of finished grade. The base shall be level to within ±1/4 inch.

Connect the insolating transformer with L-823 connector kits and heat shrink tubing. Ensure that all field installed primary cable connectors have the plug pin connectors and receptacle socket connectors properly positioned within their respective connector bodies, as detailed by the connector manufacturer, prior to the shrinking of heat shrink tubing at the cable-connector interface.

Install isolating transformers in the light bases as shown on the Plans. Where called for on the Plans, install isolating transformers in all light bases by placing on top of a 14 inch (extended height) approved transformer supporting platform as specified. Train all connections to the isolating transformer to lay in the upper section of the light base, above the transformer platform and below the cover flange, as shown on the Plans. Provide adequate primary and secondary cable slack in each light base to assure that all connectors can be grouped and trained in the upper section of the light base without subjecting the connector to tension.

Label each edge light assembly with the letter and number designation as indicated on the Plans. Label by permanently die-stamping the letter and number designation onto the light base and base cover plate with 1/4 inch figures.

Install the light fixtures with stainless steel hardware and coat the bolts and frangible couplings with a suitable corrosion inhibitor prior to being installed. Install the light fixtures with lamp, clean the lenses, align and adjust each optical system according to the manufacturer's instructions.

100-3.3 INSTALLATION OF FLUSH LIGHTS. Install flush light fixtures according to the Plans and specifications.

Install flush runway edge and centerline light fixtures and taxiway centerline light fixtures after the old pavement has been cold planed, and before the asphalt is placed. Install flush taxiway and runway centerline and touchdown zone light fixtures on new runways or taxiways after the first asphalt lift and before the final lift.

Core remaining asphalt at the runway centerline light base locations a minimum diameter of 24 inches and remove the base course material to the depth shown. Compact the bottom of the cored hole before pouring concrete.

Use a setting jig to install the bottom section of the light base assembly, as shown in the Plans. The bottom of the light base shall be at least 6 inches above the bottom of the excavation. Provide no more than 4 threaded hubs for the bottom section of the light base, as shown on the Plans. Connect the bottom section of

the light bases to the rigid steel conduit system, using rubber grommets or waterproof nipples and couplings. Usually one waterproof sealtite flexible coupling will suffice for each two-hubbed light base.

Call for inspection of the light base assembly prior to the backfilling of the excavations. Backfill with poured PCC meeting the requirements of Item P-610. Fill the excavation only to the level shown. Allow a 3 inch thickness of asphalt pavement over the PCC and over the light base mudplate.

After the PCC has cured at least 72 hours, apply tack coat and overlay with Asphalt Concrete Pavement.

Plug the conduit ends during the course of construction to prevent accumulation of water or debris in the conduit.

When ready to install the inset lights, determine the location of the light base and drill a small diameter core hole to locate the center of the mud plate. Next, drill a 16 inch diameter core hole over the center of the mud plate (± 1/4 inch). Use a coring machine of adequate stability to prevent "wobble". After removing the core, mud plate, plywood cover, and any water or debris that has accumulated, apply a thin layer of self-leveling silicone sealer between the bottom flange of the top section and the top flange of the bottom section and bolt the top section using 18-8, 410, or 416 stainless steel all-thread bolts. Coat the bolts with a suitable corrosion inhibitor prior to installing. Use two-piece cam-type lock washers and torque the bolts to 180 inch-pounds or as recommended by the manufacturer.

Make a "dry system" light fixture installation, using a grooved flange ring, "O" ring, and concrete ring. If the actual elevation of the pavement overlay does not equal the estimated elevation, provide spacer rings or flange rings of different thickness. Bolt the fixture to the top section using 18-8, 410, or 416 stainless steel bolts. Coat the bolts with a suitable corrosion inhibitor prior to installing. Use two piece cam-type lock washers, and torque the bolts to 180 inch-pounds, or as recommended by the manufacturer. Set the outboard edge of the fixture 1/4 to 3/8 inch below the adjacent finished pavement.

Install the light fixtures per the Plans and the specifications and the manufacturers recommended procedure. Do not deviate from these procedures, or the materials shown or specified, without the prior approval of the Engineer.

100-3.4 INSTALLATION OF WATERTIGHT EDGE LIGHTS. Test the base assemblies, saddle fittings, and plastic duct as a complete system or in sections to insure that it is watertight. If a pneumatic test is performed to meet this requirement, the minimum pressure shall be 10 psi for a minimum of 10 minutes.

Base assemblies shall be sealed watertight and conduit openings and any holes shall be caulked with duct seal to prevent any water from entering the base assemblies. After the connection of the isolating transformer with L-823 connector kits the light bases shall be completely filled with free flowing insulating material.

The light base assemblies shall be sealed watertight using the following method and materials or approved equal:

a. Spot weld the weep hole in the bottom of the base plate hub, if present.

b. To insure that no water leaks into the can, use a soft neoprene gasket under the base plate. The gasket shall be covered on both sides with a generous coating of lubricant and sealant to prevent water seepage during freeze-thaw cycles.

c. Install seal washers with stainless steel cups under the bolt heads. The torque on the six bolts should be approximately 25 plus or minus 5 inch-pounds. A torque wrench must be used.

d. After installation of the base plate, plug in the edge light. Using clear adhesive sealant, coat the threads of the frangible coupling and screw into place. Plug the weep hole with adhesive sealant. Put adhesive sealant around the bottom of the frangible coupling at the junction with the base plate.

e. Install the edge light stem securely. Then, using more adhesive sealant, fill the space between the edge light stem and the inside diameter of the frangible coupling. Install the light fixtures with lamp, clean the lenses, align and adjust each optical system according to the manufacturer's instructions.

100-3.5 INSPECTION. Notify the Engineer in writing and request inspection at least 48 hours prior to installing lighting fixtures, making any splices, or covering any buried or concealed work. Immediately correct any deficiencies found during the inspection.

100-3.6 RECORD DOCUMENTS. Maintain at the project site a complete set of contract Plans, specifications and approved changes thereto. In addition to the above, 2 complete sets of electrical plans shall be maintained for as-built purposes upon which all changes, connections, part numbers and conductor routings shall be legibly shown and noted. Where changes to Plans are involved, make notations to show the dates and authorities approving the changes. Permanently store one set of annotated electrical plans in a dry, secure location at the project site. Deliver the second set to the Engineer.

As-built plans shall show locations of all buried items such as conduit, including any existing active lines encountered. All dimensions shall be from runway and taxiway centerlines or other permanent objects. As-built plans shall include complete wiring diagrams, (both power and control), identifying terminals, cables, and connections. As-built plans shall be kept current as the work progresses.

100-3.7 GUARANTEE. Furnish a written guarantee that any materials or workmanship found defective within one year of final acceptance shall be replaced at no additional cost to the Department, promptly upon notification and to the satisfaction of the Engineer.

100-4.1 METHOD OF MEASUREMENT.

a. **Lump Sum.** No measurement of quantities will be made.

b. **Unit Prices.** The quantity to be paid for will be the number of units installed, complete, in place, accepted, and ready for operation, or the number of units acceptably removed.

BASIS OF PAYMENT

100-5.1 ITEMS OF WORK PAID IN OTHER SECTIONS. All work and materials required to install cable, conduit, and ground rods is paid for under Items L-108, and L-110.

All work and materials required to install remote relay assembly and remote control panel are paid for under item L-109.

100-5.2 ITEMS OF WORK PAID IN THIS SECTION. At the contract lump sum or unit prices for the completed and accepted job.

Refer to Item P-610 for requirements regarding all work and materials to place portland cement concrete. Portland cement concrete is subsidiary to L-100 items requiring its use.

Item L-100a, Airport Lighting: Includes all work required under this item to provide the complete airport lighting system, except work listed above which is paid for under other items.

Item L-100b, Regulator, L-828: Includes mounting, electrical connection (with all input control and output circuits), painting and stenciling. Size as indicated on Plans.

Item L-100c, High Intensity Runway Edge and Threshold Light, L-862 and L-862E: Includes L-868 base assembly, gasket, frangible coupling, L-830-6, 200 W isolating transformer, and L-823 cable connectors.

Item L-100d, Medium Intensity Runway Edge and Threshold Light, L-861 and L-861E: Includes L-867 base assembly, grounding lug and connector, cover, gasket, support column, frangible coupling, 30/45 W L-830-1 isolating transformer, transformer mounting platform (when shown on Plans), and L-823 cable connectors.

Item L-100e, Taxiway Edge Light, L-861T: Includes L-867 base assembly, grounding lug and connector, cover, gasket, support column, frangible coupling, 30/45 W L-830-1 isolating transformer, transformer mounting platform (when shown on Plans), and L-823 cable connectors.

Item L-100f, Wind Cone Handhole, L-867, Size D: Includes steel cover and gasket, grounding lug and connector, L-823 primary and secondary cable connectors, and PA-4 power adapter (when specified on the Plans).

Item L-100g, Primary Handhole, L-868, Size B: Includes traffic rated steel cover and gasket, grounding lug and connector.

Item L-100h, Remove ~~existing~~ Runway and Taxiway Light: Includes removal of fixtures, transformers, and bases.

Item L-100i, Flush Runway Centerline Light, L-850A or L-850B: Includes L-868 base assembly, spacer rings, flange ring, steel cover, concrete work, asphalt patching and sealing.

Item L-100j, Flush Taxiway Centerline Light, L-852A, L-852B, L-852E or L-852G: Includes L-868 base assembly, spacer rings, flange ring, L-830 isolating transformer, L-823 Cable connectors, concrete work, asphalt patching and sealing.

Item L-100k, Flush Runway Edge Light, L-850C: Includes L-868 base assembly, spacer rings, flange ring, L-830 isolating transformer, L-823 Cable connectors, concrete work, asphalt patching and sealing.

Item L-100l, Relocate ~~Existing~~ Airport Sign, Type L-858: Includes L-867 base, frangible couplings, transformer, concrete base, and sign faces as shown.

Item L-100m, Runway Guard Light, L-804: Includes L-867 base assembly.

Item L-100n, Airport Sign, Type L-858: Includes sign, L-867 base, frangible couplings, transformer, concrete base, sign faces as shown.

Item L-100o, Power or Communications Pedestal: Includes anchor stake and conduits as shown.

Item L-100p, Handhole, L-867, Size B: Includes grounding lug, steel cover, and gasket.

Item L-100q, Junction Box, Type II.

Item L-100ag, Junction Box, Type III

Payment will be made under:

Item L-100a	Airport Lighting - per lump sum
Item L-100b	Regulator, L-828 - per each
Item L-100c	High Intensity Runway Edge and Threshold Light, L-862 and L-862E - per each
Item L-100d	Medium Intensity Runway Edge and Threshold Light, L-861 and L-861E - per each
Item L-100e	Taxiway Edge Light, L-861T - per each
Item L-100f	Wind Cone Handhole, L-867, Size D - per each
Item L-100g	Primary Handhole, L-868, Size B – per each
Item L-100h	Remove ~~existing~~ Runway and Taxiway Light - per each
Item L-100i	Flush Runway Centerline Light, L-850A or L-850B - per each
Item L-100j	Flush Taxiway Centerline Light, L-852A, L-852B, L-852E or L-852G - per each
Item L-100k	Flush Runway Edge Light, L-850C - per each

Item L-100l	Relocate ~~Existing~~ Airport Sign, Type L-858 - per each
Item L-100m	Runway Guard Light, L-804 - per each
Item L-100n	Airport Sign, Type L-858 - per each
Item L-100o	Power or Communications Pedestal – per each
Item L-100p	Handhole, L-867, Size B – per each
Item L-100q	Junction Box, Type II – per each
Item L-100ag	Junction Box, Type III – per each

MATERIAL REQUIREMENTS

AC 150/5345-10	*Constant Current Regulators and Regulator Monitors*
AC 150/5345-42	*Airport Light Bases, Transformer Houses, Junction Boxes and Accessories*
AC 150/5345-44	*Taxiway and Runway Signs*
AC 150/5345-46	*Runway and Taxiway Light Fixtures*
AC 150/5345-47	*Isolation Transformers for Airport Lighting Systems*
AC 150/5345-49	*L-854, Radio Control Equipment*
AC 150/5345-53	*Airport Lighting Equipment Certification Program*
ASTM D 1557	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb. Rammer and 18-in Drop

ITEM L-101 ROTATING BEACON

DESCRIPTION

101-1.1 This item shall consist of furnishing and installing airport rotating beacons. This work shall include the mounting, leveling, wiring, painting, servicing, and testing of the beacon and all materials and incidentals necessary to place the beacon in operating condition as a completed unit to the satisfaction of the Engineer. This item shall include a mounting platform if specified in the Plans.

EQUIPMENT AND MATERIALS

101-2.1 GENERAL.

a. Airport lighting equipment and materials covered by FAA specifications shall be certified and listed under AC 150/5345-53, Airport Lighting Equipment Certification Program. This AC, the latest certified equipment list, and the address list of certified airport lighting equipment manufacturers are available on the Internet home page for the FAA Office of the Associate Administrator for Airports (ARP). The internet address is http://www.faa.gov/airports_airtraffic/airports/construction/.

b. All other equipment and materials covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the Engineer.

101-2.2 BEACON. The beacon shall meet the requirements of AC 150/5345-12, Specification for Airport and Heliport Beacons. The beacon shall be a L-801A or L-802A, Class II, with metal-halide lamp(s).

a. The beacon shall be supplied with an arctic kit to provide supplemental heating to the beacon mechanisms and bearings for operations in extreme weather. If the manufacturer does not offer an optional arctic kit, the beacon shall be modified as outlined in this paragraph. The beacon shall, at a minimum, be equipped with a 150 W strip heater installed to keep the motor and beacon housing warm during extreme cold weather conditions. An air-sensing thermostat shall be supplied with contacts rated for 16 A, 120 V. The thermostat shall be constructed so that contacts close on descending temperatures adjustable between 0 °F and 30 °F, +/- 4 °F. The contacts shall open on rising temperatures at 15 °F above closing temperature.

b. The internal heater and internal thermostatic control kit shall be field wired separate from the beacon lights and motor (see beacon wiring diagram on the Plans).

c. The beacon contactor shall be 2-pole, 30 A, with an operating coil designed for 120 V, 60 Hz., and shall be mounted in the control panel with its operating coil circuit connected through an on-off-auto switch as shown on the Plans.

101-2.3 PANEL BOARDS AND BREAKERS. Panel boards and breakers shall conform to the requirements of Fed. Spec. W-P-115.

101-2.4 WEATHERPROOF CABINETS. The weatherproof cabinets shall conform to NEMA Standards and shall be constructed of steel not less than No. 16 USS gauge.

101-2.5 WIRE. Wire in conduit rated up to 5,000 V shall conform to AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits, for Rubber Insulated Neoprene Covered Wire, or Fed. Spec. J-C-30, Type RHW, for rubber insulated fibrous covered wire. For ratings up to 600 V, the thermoplastic wire conforming to Fed. Spec. J-C-30, Types TW, THW, and THWN, shall be used. The wires shall be of the type, size, number of conductors, and voltage shown in the Plans or in the specifications.

101-2.6 CONDUIT. Rigid steel conduit and fittings shall conform to the requirements of UL Standard 6, 514, and 1242.

101-2.7 PAINT.

a. Priming paint for ungalvanized metal surfaces shall be a high solids alkyd primer conforming to Fed. Spec. TT-P-664D.

b. Priming paint for galvanized metal surfaces shall be zinc dust-zinc oxide primer paint conforming to MIL-P-24441/19B. If necessary, add not more than 1/2 pint of turpentine to each gallon of paint.

c. Orange paint for the body and the finish coats on metal and wood surfaces shall consist of a ready-mixed non-fading paint meeting the requirements of Fed. Spec. TT-E-489. The color shall be according to Federal Standard 595, Aviation Gloss Orange, Number 12197.

d. White paint for body and finish coats on metal and wood surfaces shall be ready-mixed paint conforming to Commercial Item Description A-A-3067.

e. Priming paint for wood surfaces shall be mixed on the job by thinning the above specified orange or white paint with 1/2 pint of raw linseed oil to each gallon.

CONSTRUCTION METHODS

101-3.1 PLACING THE BEACON. The beacon shall be mounted on a beacon tower, platform, or building roof as shown in the Plans.

101-3.2 HOISTING AND MOUNTING. The beacon shall be hoisted to the mounting platform by using suitable slings and hoisting tackle. Before fastening the beacon to the mounting platform, the mounting holes shall be checked for correct spacing. Beacon base or mounting legs shall not be strained or forced out of position to fit incorrect spacing of mounting holes. The beacon base shall be raised first, set in position, and bolted in place. The beacon shall then be raised and assembled to the base.

101-3.3 LEVELING. After the beacon has been mounted in place, it shall be accurately leveled. The leveling shall be checked in the presence of the Engineer and shall be to the Engineer's satisfaction.

101-3.4 SERVICING. Before placing the beacon in operation, the Contractor shall accomplish the following:

a. Clean and polish all glassware, both inside and outside, using a type of cleaner which will not scratch the lens, and clean the interior of the beacon.

b. Clean interior of beacon base and check for alignment of parts.

c. Clean and lubricate all mechanical system according to manufacturer's recommendations. Assure that all subassemblies are properly aligned and working properly.

d. Secure lamps properly in the sockets.

101-3.5 BEAM ADJUSTMENT. After the beacon has been mounted and leveled, the vertical angle of the beams shall be adjusted. The final beam adjustments shall be made at night so that results can be readily observed. The beams shall be adjusted to the vertical angle directed by the Engineer or as shown in the Plans, except that, in no case shall the vertical angle of the beams be less than 2° above the horizontal.

101-3.6 BEACON MOUNTING PLATFORM. Where the beacon is to be mounted at a location other than a beacon tower and where a special mounting platform is required, the construction of this mounting platform and any necessary lightning protection equipment shall be according to the details shown in the Plans.

101-3.7 WIRING. The Contractor shall furnish all necessary labor and materials and shall make complete above ground electrical connections according to the wiring diagram furnished with the project Plans.

If underground cable for the power feed from the transformer vault to the beacon site and duct for this cable installation under paved areas is required, the cable and duct shall be installed according to L-108, Underground Cable, and Item L-110, Underground Electrical Duct. No separate measurement or payment will be made for underground wire or conduit.

If obstruction lighting is specified, the Contractor shall connect the tell-tale relay mechanism in the beacon to energize the tower obstruction light circuit when failure of the beacon service (primary) lamp occurs.

If lightning protection is specified in the Plans or specifications as a part of this item, it shall be according to subsections 103-2.3, 2.4, 2.5, 2.6, and 3.4 in Item L-103, Beacon Tower.

101-3.8 PANEL AND CABINET. Unless otherwise specified, the Contractor shall furnish and install, at the top of the beacon tower or mounting platform, a circuit-breaker panel consisting of four 15-ampere breakers mounted in a weather-proof cabinet to provide separate protection for the circuits to the beacon lamps, motor, obstruction lights, and other equipment. The cabinet shall be located on the side of the beacon platform, as directed by the Engineer.

101-3.9 CONDUIT. All exposed wiring shall be run in not less than 1/2 inch galvanized rigid steel conduit. No conduit shall be installed on top of a beacon platform floor. All conduit shall be installed to provide for drainage. If mounted on a steel beacon tower, the conduit shall be fastened to the tower members with "wraplock" straps, clamps, or approved fasteners, spaced approximately 5 feet apart. The conduit shall be fastened to wooden structures with galvanized pipe straps and with galvanized wood screws not less than No. 8 nor less than 1-1/4 inches long. There shall be at least two fastenings for each 10-foot length.

101-3.10 BOOSTER TRANSFORMER. If shown in the Plans or specified in job specifications, a booster transformer to compensate for voltage drop to the beacon shall be installed in a suitable weatherproof housing under or on the tower platform or at the base of the tower. The installation shall be as indicated in the Plans and described in the specifications. If the booster transformer is required for installation in the transformer vault, it shall be installed according to L-109, Transformer Vault and Vault Equipment. No separate measurement or payment will be made for the booster transformer.

101-3.11 PHOTOELECTRIC CONTROL. If shown in the Plans or specified in job specifications, the Contractor shall furnish and install an automatic control switch at the location indicated in the Plans. The switch shall be a photoelectric type. It shall be a standard commercially available unit suitable for aviation service. It shall be installed, connected, and adjusted according to the manufacturer's instructions.

101-3.12 OBSTRUCTION LIGHTS. Unless otherwise specified, the Contractor shall install on the top of the beacon tower two L-810 obstruction lights on opposite corners. These lights shall be mounted on conduit extensions to a height of not less than 4 inches above the top of the beacon. They shall be connected in series into the tell-tale circuit with the necessary relay and wiring connections.

101-3.13 PAINTING. If construction of a wooden mounting platform is stipulated in the specifications as part of this item, all wooden parts of the platform shall be given one priming coat of white or aviation-orange paint after fabrication but before erection and one body and one finish coat of aviation-orange paint after erection. Steel mounting platforms shall be given one priming coat of corrosion-inhibiting primer before erection and one body and one finish coat of aviation-orange paint after erection. All equipment installed under this contract and exposed to the weather shall be given one body and one finish coat of aviation-orange or white paint as required. This shall include beacon (except glass surfaces), beacon base, breaker cabinet, all conduit, and transformer cases. It shall not include lightning rods or obstruction light globes.

The paint shall be applied uniformly in the proper consistency by skilled painters. The finished paint shall be free from sags, holidays, and smears. Each coat of paint shall be given ample time to dry and harden before the next coat of paint is applied. A minimum of 3 days shall be allowed for drying on wood surfaces, and a

minimum of 4 days shall be allowed for drying on metal surfaces. Painting shall not be done in cold, damp, foggy, dusty, or frosty atmospheres, or when air temperature is below 40 °F, nor started when the weather forecast indicates such conditions for the day.

All surfaces shall be cleaned before painting. The surfaces shall be dry and free from scale, grease, rust, dust, and dirt when paint is applied. All knots in wood surfaces shall be covered with shellac immediately before applying the priming coat of paint. Nail holes and permissible imperfections shall be filled with putty.

The ready-mixed paint shall be thinned for the priming and body coats according to the manufacturer's recommendations. In the absence of such recommendations, the following shall apply:

a. Body coats (for both wood and steel surfaces) - add 1/2 pint of turpentine to each gallon of ready-mixed paint for body coats.

b. Finish coats (for both wood and steel surfaces) - the ready-mixed paint shall be used as it comes from the container for finish coats.

101-3.14 TESTING. The installation shall be fully tested in operation as a completed unit prior to acceptance. These tests shall include operation of the lamp-changer and taking megger and voltage readings. The insulation resistance to ground of the beacon supply circuit shall be not less than 50 megohms when measured ungrounded. Testing equipment shall be furnished by the Contractor. Tests shall be conducted in the presence of the Engineer and shall be to their satisfaction.

101-3.15 GUARANTEE. Furnish a written guarantee that any materials or workmanship found defective within one year of final acceptance shall be replaced at no additional cost to the Department, promptly upon notifications and to the satisfaction of the Engineer.

METHOD OF MEASUREMENT

101-4.1 The quantity to be paid for shall be the number of beacons installed as completed units in place, accepted, and ready for operation.

BASIS OF PAYMENT

101-5.1 Payment will be made at the contract unit price for each completed and accepted job.

Payment will be made under:

Item L-101a	Rotating Beacon, High Intensity, L-802A - per each
Item L-101b	Rotating Beacon, Medium Intensity, L-801A - per each

MATERIAL REQUIREMENTS

AC 150/5345-7	*L-824 Underground Cable for Airport Lighting Circuits*
AC 150/5345-12	*Airport and Heliport Beacons*
Commercial Item Description A-A-3067	Paint: Alkyd, Exterior, Low VOC
Fed.Spec. J-C-30	Cable and Wire, Electrical (Power, Fixed Installation)
Fed. Spec. TT-E-489	Enamel, Alkyd, Gloss, Low VOC Content

Fed. Spec. TT-P-664D	Primer Coating, Alkyd, Corrosion-Inhibiting, Lead and Chromate Free, VOC-Compliant
Fed.Spec. W-P-115	Panel, Power Distribution
Fed. Std. 595	Colors
MIL-P-24441/19B	Paint, Epoxy-Polyamide, Zinc Primer, Formula 159, Type III
UL Standard 6	Rigid Metal Conduit
UL Standard 514	Fittings for Conduit and Outlet Boxes
UL Standard 1242	Intermediate Metal Conduit

ITEM L-107 WIND CONE

DESCRIPTION

107-1.1 This item shall consist of furnishing and installing lighted and unlighted airport wind cones according to these specifications and according to the dimensions, design, and details shown in the Plans.

For lighted wind cones, the work shall include the furnishing and installation of a support for mounting the wind cone, the furnishing and installing of the specified wire from the wind cone to the electrical control panel, and a concrete foundation. The item shall also include all cable connections, the furnishing and installing of the conduit and conduit fittings from the wind cone base to the first hand hole, the furnishing and installation of all lamps, ground rod and ground connection, the testing of the installation, and all incidentals necessary to place the wind cone in operation as a completed unit to the satisfaction of the Engineer.

For unlighted wind cones, the work shall include the furnishing and installation of a support for mounting the wind cone and a concrete foundation.

EQUIPMENT AND MATERIALS

107-2.1 GENERAL.

a. Airport lighting equipment and materials covered by FAA specifications shall be certified and listed under AC 150/5345-53, Airport Lighting Equipment Certification Program. This AC, the latest certified equipment list, and the address list of certified airport lighting equipment manufacturers are available on the Internet home page for the FAA Office of the Associate Administrator for Airports (ARP). The internet address is http://www.faa.gov/airports_airtraffic/airports/construction/.

b. All other equipment and materials covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the Engineer.

107-2.2 WIND CONES. The 8-foot and 12-foot wind cones and assemblies shall conform to the requirements of AC 150/5345-27, Specification for Wind Cone Assemblies. The pole shall be a steel pole hinged in the middle, and designed to withstand sustained winds of 94 mph minimum.

a. Type L-807, Style I-A, Size 1, externally lighted wind cone.
b. Type L-807, Style 1-B, Size 1, internally lighted wind cone.
~~**b.**~~**c.** Type L-807, Style I-A, Size 2, externally lighted wind cone.
d. Type L-807, Style 1-B, Size 2, internally lighted wind cone.
~~**c.**~~**e.** Type L-807, Style II, Size 1, unlighted wind cone.
~~**d.**~~**f.** Type L-807, Style II, Size 2, unlighted wind cone.

107-2.3 WIRE. Wire in conduit rated up to 5,000 V shall conform to AC 150/5345-7, Specification for L-824 Underground Cable for Airport Lighting Circuits, Type C cross-linked polyethylene insulated wire. For ratings up to 600 V, cross-linked polyethylene insulated wire type XHHW, shall be used. The wires shall be of the type, size, number of conductors, and voltage shown in the Plans.

107-2.4 CONDUIT. Rigid steel conduit and fittings shall conform to the requirements of UL Standard 6, 514, and 1242.

107-2.5 CONCRETE. Design the foundation based on the soil bearing capacity of the soils located at the pole site, pole mechanics, and wind loads. Provide a foundation that will allow adjustment of the pole with a wrench by tightening or loosening bolts and a pole adjustment range of 5 degrees minimum without compromising the pole wind rating.

Design the foundation as necessary to resist pole lateral, uplift, and overturning forces. Submit calculations stamped by a Professional Engineer to the Engineer for approval. The concrete for foundations shall be proportioned, placed, and cured according to Item P-610, Structural Portland Cement Concrete.

107-2.6 PAINT.

a. Primer for ungalvanized metal surfaces shall be a high solids alkyd primer conforming to Federal Specification TT-P-664D.

b. Primer for galvanized metal surfaces shall be zinc dust-zinc oxide primer paint conforming to MIL-P-24441/19B. If necessary, thin with not more than 1/2 pint of turpentine per gallon of primer.

c. Orange paint for the body and the finish coats on metal surfaces shall consist of a ready-mixed nonfading paint meeting the requirements of Fed. Spec. TT-E-489. The color shall be according to Federal Standard 595, Aviation Gloss Orange, Number 12197.

107-2.7 WIND CONE. The wind cone fabric shall be standard international orange.

CONSTRUCTION METHODS

107-3.1 INSTALLATION. The hinged pole shall be installed on the concrete foundation ~~as shown in the Plans~~ in accordance with these specifications and the manufacturer's drawings. Do not grout between the base plate and the foundation to allow for air circulation and inhibit corrosion inside the pole.

a. Notify the Engineer at least 24 hours prior to placement of concrete. Allow concrete bases to cure for 7 days after pouring before installing the hinged pole

b. Backfill. Material used as backfill around the footing of the lighted wind cone shall be gravel or sand consisting of crushed or naturally occurring granular material. All materials shall be free of frozen lumps and clay particles.

107-3.2 COUNTERWEIGHT. The Contractor shall furnish and install a counterweight on the hinged support for the 12-foot wind cone. The counterweight may consist of lead weights which may be furnished with the "A" frame assembly or it may consist of concrete poured around the bottom of the hinged support. Where concrete is used, the counterweight shall be approximately 12 inches wide by 2 feet deep and should weigh approximately 500 pounds. The counterweight shall be 25 to 50 pounds less than the weight needed to balance the assembly. The counterbalancing must operate to the satisfaction of the Engineer.

107-3.3 ELECTRICAL CONNECTION. The Contractor shall furnish all labor and materials and shall make complete electrical connections according to the wiring diagram furnished with the Plans.

If underground cable from the transformer vault to the wind cone site and duct for this cable installation under paved areas is required, the cable and duct will be paid for as part of the wind cone pay item.

107-3.4 BOOSTER TRANSFORMER. If shown in the Plans or specified in the Special Provisions, a booster transformer to compensate for voltage drop to the lamps shall be installed in a suitable weatherproof housing. The booster transformer shall be installed as indicated in the Plans and described in the Special Provisions. If the booster transformer is required for installation in the transformer vault, it will be paid for as part of the wind cone pay item.

107-3.5 GROUND CONNECTION AND GROUND ROD. The Contractor shall furnish and install a ground rod, grounding cable, and ground clamps for grounding the "A" frame of the 12-foot assembly or pipe support of the 8-foot support near the base. The ground rod shall be of the diameter and length specified in the Plans and shall be copper or copper clad. The ground rod shall be driven into the ground adjacent to the concrete foundation so that the top is at least 0.5 foot below grade. The grounding cable shall consist of No. 8 AWG bare stranded copper wire or larger and shall be firmly attached to the ground rod by means of a ground

connector or clamp. The other end of the grounding cable shall be securely attached to a leg of the "A" frame or to the base of the pipe support with noncorrosive metal and shall be of substantial construction. The resistance to ground shall not exceed 25 ohms.

107-3.6 PAINTING. Three coats of paint shall be applied (1 prime, 1 body, and 1 finish) to all exposed material installed under this item except the fabric cone, obstruction light globe, and lamp reflectors. The wind cone assembly, if painted on receipt, shall be given 1 finish coat of paint in lieu of the 3 coats specified above.

107-3.7 LAMPS. The Contractor shall furnish and install lamps, as required, conforming to the following requirements and as indicated on the drawings:

a. **Incandescent.** Provide four 200-W, 115-V general lighting service lamps in the reflectors for the 12-foot cone or four 150-W, 115-V lamps for the 8-foot cone. A clear 100-W, 107-W, or 116-W, 115-V traffic signal lamp with a medium screw base, or a 100-W. A 69 W, L-810, 115 V, medium prefocus base lamp shall be furnished and installed in the obstruction light as required.

b. **LED.** Two 55-VA four-lamp, 120-V, LED fixtures with independent lamp circuits for general illumination for the 12-foot cone. One 55-VA four-lamp, 120-V, LED fixtures with independent lamp circuits for general illumination for the 8-foot cone. Furnish and install an L-810, LED, 120-V obstruction light as required.

107-3.8 WINCH AND PADLOCK. The Contractor shall furnish and install a suitable locking ratchet winch for lowering and raising the hinged top section.

A padlock shall also be furnished by the Contractor on the 8-foot wind cone for securing the hinged top section to the fixed lower section. Three keys for the padlock shall be delivered to the Engineer.

107-3.9 TESTING. Furnish all necessary labor, equipment and appliances for testing all material and equipment as specified herein. No work will be accepted until all applicable tests have been performed. Tests shall not begin until the work has been approved by the Engineer. All tests shall be neatly tabulated on a reproducible "Test Sheet" which shall be signed and dated by the Contractor upon completion of the test. Test and demonstrate to the Engineer the following:

a. That all lighting, power, and control circuits are continuous, and free from short circuits.

b. That all circuits are free from unspecified grounds.

c. That the resistance to ground of all non-ground 5000 V circuits is not less than 50 megohms. Where additions are made to existing circuits, only the new section shall be tested. The resistance to ground of 600 V capacity shall be 10 megohms for the insulation test.

d. That all circuits are properly connected according to applicable wiring diagrams.

e. That all circuits are operable.

107-3.10 GUARANTEE. Furnish a written guarantee that any materials or workmanship found defective within 1 year of final acceptance shall be replaced at the Contractor's expense, promptly upon notification and to the satisfaction of the Engineer.

METHOD OF MEASUREMENT

107-4.1 The quantity to be paid for will be the number of wind cones installed as completed units in place, accepted, and ready for operation.

BASIS OF PAYMENT

107-5.1 Payment will be made at the contract unit price for each completed and accepted job.

Payment will be made under:

Item L-107a	8-foot Lighted Wind Cone, in place - per each
Item L-107b	12-foot Lighted Wind Cone, in place - per each
Item L-107c	8-foot Unlighted Wind Cone, in place - per each
Item L-107d	12-foot Unlighted Wind Cone, in place - per each

MATERIAL REQUIREMENTS

AC 150/5345-7	L-824 Underground Cable for Airport Lighting Circuits
AC 150/5345-27	Wind Cone Assemblies
ASTM A 615	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
Commercial Item Description A-A-3067	Paint: Alkyd, Exterior, Low VOC
Fed. Spec. J-C-30	Cable and Wire, Electrical (Power, Fixed Installation)
Fed. Spec. TT-E-489	Enamel, Alkyd, Gloss, Low VOC Content
Fed. Spec. W-P-115	Panel, Power Distribution
Fed. Std. 595	Colors
MIL-P-24441/19B	Paint, Epoxy-Polyamide, Zinc Primer, Formula 159, Type III
UL Standard 6	Rigid Metal Conduit
UL Standard 514	Fittings For Conduit and Outlet Boxes
UL Standard 1242	Intermediate Metal Conduit

ITEM L-108 UNDERGROUND CABLE

DESCRIPTION

108-1.1 This item shall consist of furnishing and installing underground cable according to these specifications at the locations shown in the Plans. This item shall include the excavation and backfill of the trench, where direct buried cable is specified, and the installation of cable, grounding and counterpoise wire in trench, duct or conduit. It shall include splicing, cable marking, and testing of the installation and all incidentals necessary to place the cable in operating condition as a completed unit to the satisfaction of the Engineer. This item shall not include the installation of the duct or conduit.

EQUIPMENT AND MATERIALS

108-2.1 GENERAL.

a. Airport lighting equipment and materials covered by FAA specifications shall be certified and listed under AC 150/5345-53, Airport Lighting Equipment Certification Program. This AC, the latest certified equipment list, and the address list of certified airport lighting equipment manufacturers are available on the Internet home page for the FAA Office of the Associate Administrator for Airports (ARP). The internet address is http://www.faa.gov/airports_airtraffic/airports/construction/.

b. All other equipment and materials covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification, when requested by the Engineer.

108-2.2 CABLE. Underground cable shall conform to the requirements of AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits, and meet the following requirements.

5000 V cable shall be non-shielded, single conductor, FAA type C, with cross-linked polyethylene insulation or FAA type B, ICEA S-19-81 ozone-resistant butyl rubber insulated with overall jacket of heavy duty neoprene. Conductor shall be lead alloy coated, soft annealed stranded copper.

600 V cable shall be non–shielded, single conductor, with stranded annealed copper conductor, rated 190 °F, with cross-linked polyethylene insulation classified as UL type-2 and FAA type C.

Underground Electrical Cable shall be No. 14 AWG, 2 Conductor, copper, 600 V, Type SOOW-A/SOOW. Cable shall remain flexible down to -40 °F. The cable connectors shall be secondary connector kits for the plug and the receptacle meeting specification L-823.

If telephone control cable is specified, copper shielded, polyethylene insulated and jacketed, No. 19 AWG telephone cable conforming to ICEA-S-85-625, Standard, Aircore, Polyolefin, Copper Conductor Telecommunications Cable for direct burial, shall be used.

Where counterpoise conductors are to be installed and where soil conditions would adversely affect bare copper wire, cross-linked polyethylene wire conforming to Fed. Spec. J-C-30, Type XHHW, 600 volt, may be used.

Cable type, size, number of conductors, strand and service voltage will be specified in the Plans and/or specifications.

108-2.3 BARE COPPER WIRE (COUNTERPOISE OR GROUNDING). Bare copper wire for counterpoise or grounding installations shall be solid or stranded wire conforming to ASTM B 3 and B 8.

108-2.4 CABLE CONNECTIONS. In-line connections of underground primary cables shall be of the type called for in the Plans or in the specifications, and shall be one of the types listed below. When the Plans or the specifications permit a choice of connection, the Contractor shall indicate in the bid the type of connection they propose to furnish.

a. **Cast Splice.** A cast splice, employing a plastic or metal mold and using epoxy resin manufactured by Minnesota Mining and Manufacturing Company, "Scotchcast" Kit No. 82B, or approved equal, is to be used for potting the splice. This means of splicing is the only type approved for telephone control cable.

b. **Vulcanized Splice.** A vulcanized splice with proper molds for various cable sizes shall be used.

c. **Field-attached Plug-in Splice.** Figure 3 of AC 150/5345-26, Specification for L-823 Plug and Receptacle, Cable Connectors, employing connector kits, is approved for field attachment to single conductor cable. 600 V cord sets shall include a Type II, Class A, Style I plug on a 16/2 SJO cord. 600 V secondary receptacles shall be Type II, Class B, Style II. 600 V plugs shall be Type II, Class B, Style 4. 5000 V plugs shall be Type I, Class B, Style 3. 5000 V receptacles shall be Type I, Class B, Style 10.

d. **Factory-Molded Plug-in Splice.** Specification for L-823 Connectors, Factory-Molded to Individual Conductors, are approved.

e. **Taped Splice.** Taped splices employing field-applied rubber, or synthetic rubber tape covered with plastic tape are approved. The rubber tape should meet the requirements of ASTM D 4388 and the plastic tape should comply with Mil. Spec. MIL-I-24391 or Commercial Item Description A-A-55809. In all the above cases, connections of cable conductors shall be made using crimp connectors utilizing a crimping tool designed~~.~~ T to make a complete crimp before the tool can be removed. No. 19 AWG telephone control wires may be connected by means of wrapped and soldered splice, 3M Company Moisture Proof UR Type Connector, or approved equal, or by a method approved by the Engineer. Electrical insulating tape shall be "Scotch" No. 88 or approved equal.

108-2.5 CONCRETE. Concrete for cable markers shall conform to Specification Item P-610, "Structural Portland Cement Concrete."

108-2.6 MARKER TAPE. Marker tape shall be APWA-ULCC compliant, red polyethylene plastic, printed "Caution - Buried Electric Line Below".

108-2.7 INTERSTICE FILLER. When called for on the Plans underground conduit runs shall contain, in addition to the specified conductor(s), one or more runs of compressible interstice filler (as shown on the Plans). Compressible interstice filler shall be 5/8-inch closed cell backer rod (caulk backer).

108-2.8 GROUND RODS. Ground rods shall be ¾" x 10' copper clad steel.

CONSTRUCTION METHODS

108-3.1 GENERAL. The Contractor shall install the specified cable at the approximate locations indicated in the airport lighting layout plans. The Engineer will indicate specific locations.

Notify the Engineer in writing and request inspection at least 48 hours prior to installing cables, making any splices, or covering any buried or concealed work. Immediately correct any deficiencies found during the inspection. Install cable in a manner to prevent harmful stretching of the conductors, injury to the insulation, damage to tapes and fillers or damage to the outer protective jacket or covering.

Label the circuit conductors in each manhole or handhole by attaching a heat stamped nylon identification tag bearing the circuit designation "R" or "T", as required.

Cable connections between lights will be permitted only at the light locations for connecting the underground cable to the primary leads of the individual insulating transformers. The Contractor shall be responsible for providing cable in continuous lengths for home runs or other long cable runs without connections, unless otherwise authorized in writing by the Engineer or shown in the Plans.

108-3.2 INSTALLATION IN DUCT OR CONDUIT. This item includes the installation of the cable in duct or conduit as described below. The maximum number and voltage ratings of cables installed in each single duct or conduit, and the current-carrying capacity of each cable shall be according to the latest NEC, or the code of the local agency having jurisdiction.

The Contractor shall make no connections or joints of any kind in cables installed in conduits or ducts. Provide and install cables in continuous lengths free of splices between the points of connection indicated on the Plans.

The duct or conduit shall be installed as a separate item according to Item L-110, "Underground Electrical Duct." The Contractor shall make sure that the duct is open, continuous, and clear of debris before installing cable. The cable shall be installed in a manner to prevent harmful stretching of the conductor, injury to the insulation, or damage to the outer protective covering. The ends of all cables shall be sealed with moisture-seal tape before pulling into the conduit and it shall be left sealed until connections are made. Where more than one cable is to be installed in a duct under the same contract, all cable shall be pulled in the duct at the same time. The pulling of a cable through ducts or conduits may be accomplished by hand winch or power winch with the use of cable grips or pulling eyes. Pulling tensions should be governed by recommended standard practices for straight pulls or bends. A lubricant recommended for the type of cable being installed shall be used where pulling lubricant is required. Duct or conduit markers temporarily removed for excavations shall be replaced as required.

Compressible interstice filler (when shown on the Plans and as specified) shall be installed in place with the cable(s). It shall be taped as required to attach and secure it to the conductor(s) during installation.

Where runway and taxiway series lighting circuit conductors are to be installed together through the same conduit, identify the individual conductors at both ends of the duct by applying identification ties which have been heat stamped with the circuit identification "R", "T1" or "T2" as needed.

Assemble connections in the runway and taxiway series lighting cable at the light assemblies using approved L-823 connector kits. The male end shall be coated with silicone compound. Properly seat both plug and receptacle ends onto cable and check for proper connector pin positioning prior to taping. When completed, wrap the L-823 connection with 2 layers of electrical insulating tape, 1/2 lapped extending at least 1-1/2 inch on each side of the joint. Install heat shrinkable tubing with internal adhesive as shown on Plans. Leave sufficient slack in the cables at points of connection consistent with standard trade practices; and, in the case of the runway and taxiway series lighting cable, leave sufficient slack at each light assembly to permit the connection to be made 1 foot above grade.

108-3.3 TRENCHING. Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored. Trenches for cables may be excavated manually or with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Road patrols or graders shall not be used to excavate the trench with their blades. The bottom surface of trenches shall be essentially smooth and free from coarse aggregate. Unless otherwise specified, cable trenches shall be excavated to a minimum depth of 1.5 feet below finished grade, except as follows:

a. When off the airport or crossing under a roadway or driveway, the minimum depth shall be 3 feet unless otherwise specified.

b. Minimum cable depth when crossing under a railroad track, shall be 3.5 feet unless otherwise specified.

The Contractor shall excavate all cable trenches to a width not less than 6 inches. The trench shall be widened where more than two cables are to be installed parallel in the same trench. Unless otherwise specified in the Plans, all cables in the same location and running in the same general direction shall be installed in the same trench.

When rock excavation is encountered, the rock shall be removed to a depth of at least 3 inches below the required cable depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4 inch sieve. The Contractor shall ascertain the type of soil or rock to be excavated before bidding. All excavation shall be unclassified.

108-3.4 INSTALLATION IN TRENCHES. The Contractor shall not use a cable plow for installing the cable. Mechanical cable-laying equipment may be used in conjunction with a trenching machine if specified on project Plans and specifications; and it should provide for physical inspection of cable prior to backfilling. Sharp bends or kinks in the cable will not be permitted.

Cables shall be unreeled in place alongside or in the trench and shall be carefully placed along the bottom of the trench. Inspect cable as it is removed from the reel to determine that the cable is free of visible defects. Support reel so that it turns easily and without undue strain on the cable. The cable shall not be unreeled and pulled into the trench from one end.

Where two or more cables are laid parallel in the same trench, they shall be placed laterally a minimum distance of 3 inches apart, and the trench shall be widened sufficiently to accomplish this.

Cables crossing over each other shall have a minimum of 3 inch vertical displacement with the topmost cable depth at or below the minimum required depth below finished grade.

Not less than 12 inches of cable slack shall be left on each side of all connections, insulating transformers, light units, and at all other points where cable is connected to field equipment. The slack cable shall be placed in the trench in a series of S-curves. Additional slack cable shall be left in runway light bases, handholes, manholes, etc., where it is required to bring the cable above ground level to make connections. The amount of slack cable will be stipulated by the Engineer, or as shown in the Plans and specifications.

108-3.5 BACKFILLING. After the cable has been installed, the trench shall be backfilled. The initial layer of backfill material shall be 3 inches deep, loose measurement, and shall be either earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch sieve. This layer shall not be compacted. The second layer shall be 5 inches deep, loose measurement, and shall contain no particles that would be retained on a 1-inch sieve. The remainder of the backfill shall be excavated or imported mineral and shall not contain stone or aggregate larger than 4 inches maximum diameter. The third and subsequent layers of the backfill shall not exceed 8 inches in maximum depth, loose measurement.

The second, and subsequent layers shall be thoroughly tamped and compacted to at least the density of the adjacent undisturbed soil, and to the satisfaction of the Engineer. If necessary to obtain the desired compaction, the backfill material shall be moistened or aerated as required.

Trenches shall not be excessively wet and shall not contain pools of water during backfilling operations. The trench shall be completely backfilled and tamped level with the adjacent surface, except that when sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement. Any excess excavated material shall be removed and disposed of according to instructions issued by the Engineer.

108-3.6 RESTORATION. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the trenching, storing of dirt, cable laying, pad construction, and other work shall be restored to its original condition. The restoration shall include any necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging or mulching. All such work shall be performed according to the FAA standard turfing specifications. The Contractor will be held responsible for maintaining all disturbed surfaces and replacements until final acceptance.

108-3.7 CABLE MARKERS. The location of runway light circuits shall be marked by a concrete slab marker, 2 feet square and 4 inches thick, extending approximately 1 inch above the surface. Each cable run from the line of runway lights to the equipment vault shall also be marked at approximately every 200 feet along the cable run, with an additional marker at each change of direction of cable run. All other cable buried directly in the earth shall be marked in the same manner. The Contractor shall not install slab markers where cable lies in straight lines between obstruction light poles which are spaced 300 feet apart, or less. Cable markers shall be installed immediately above the cable. The Contractor shall impress the word "CABLE" and directional arrows on each cable marking slab. The letters shall be approximately 4 inches high and 3 inches wide, with width of stroke 1/2 inch and 1/4 inch deep.

The location of each underground cable connection, except at lighting units or insulating transformers, shall be marked by a concrete marker slab placed above the connection. The Contractor shall impress the word "SPLICE" on each slab. The Contractor also shall impress additional circuit identification symbols on each slab if so desired by the Engineer.

108-3.8 SPLICING. Connections of the type shown in the Plans shall be made by experienced personnel regularly engaged in this type of work and shall be made as follows:

a. **Cast Splices.** These shall be made by using crimp connectors for jointing conductors. Molds shall be assembled, and the compound shall be mixed and poured according to manufacturer's instructions and to the satisfaction of the Engineer.

b. **Vulcanized Splices.** These shall be made by using crimp connectors for joining conductors. The splice shall be made, using compounds furnished by the manufacturer, according to their instructions and to the satisfaction of the Engineer.

c. **Field-attached Plug-in Splices.** These shall be assembled according to manufacturer's instructions. These splices shall be made by plugging directly into mating connectors. In all cases the joint where the connectors come together shall be wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches on each side of the joint.

d. **Factory-Molded Plug-in Splices.** These shall be made by plugging directly into mating connectors. In all cases, the joint where the connectors come together shall be wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches on each side of the joint.

e. **Taped Splices.** A taped splice shall be made in the following manner:

Bring the cables to their final position and cut so that the conductors will butt. Remove insulation and jacket allowing for bare conductor of proper length to fit compression sleeve connector with 1/4 inch of bare conductor on each side of the connector. Use a sharp knife to pencil insulation and jacket at approximately the same angle as a pencil point. Care must be taken to avoid nicking or injuring the conductor during removal of insulation or penciling. Do not use emery paper on splicing operation since it contains metallic particles. The copper conductors shall be thoroughly cleaned. Join the conductors by inserting them equidistant into the compression connection sleeve. Crimp conductors firmly in place with crimping tool that requires a complete crimp before tool can be removed. Test the crimped connection by pulling on the cable. Scrape the insulation to assure that the entire surface over which the tape will be applied (plus 3 inches on each end) is clean. After scraping wipe the entire area with a clean lint-free cloth. Do not use solvents.

Apply high-voltage rubber tape one-half lapped over bare conductor. This tape should be tensioned as recommended by the manufacturer. Voids in the connector area may be eliminated by highly elongating the tape stretching it just short of its breaking point. Throughout the rest of the splice less tension should be used. Always attempt to exactly half-lap to produce a uniform buildup. Continue buildup to 1-1/2 times cable diameter over the body of the splice with ends tapered a distance of approximately 1 inch over the original

jacket. Cover rubber tape with two layers of vinyl pressure-sensitive tape one-half lapped. Do not use glyptol or lacquer over vinyl tape as they react as solvents to the tape. No further cable covering or splice boxes are required.

If shielded cable is to be spliced, prepare cable as for a regular taped splice, except that the neoprene jacket shall be removed a distance not less than 5 inches from the beginning of the penciled portion. Carefully unwrap the shielding tape from that portion where jacket has been removed and cut off so that it extends about 1 inch from end of the jacket. Proceed with the taped splice as described above and tape up to 1/4 inch from the shield on both ends. Build up rubber tape to a thickness equal to the insulation thickness or 5/16 inch over connector.

Next wrap one-half lapped layer of semi-conducting tape, conforming to ASTM D 4388, Type IV, over splicing tape and 1/4 inch onto the shielding tape. Wrap a fine, flat shielding braid one-half lapped over the splice extending 1/2 inch onto the metallic shielding. Solder ends of braid to metallic shielding tape. A bonding wire, (Minimum No. 14 Stranded Copper) equal to the current carrying capacity of the metallic shield, should have the individual strands wrapped around the metallic shield at both ends of the splice. These strands should be tack soldered to the shield in several places. The cable sheath should be replaced by wrapping with two one-half lapped layers of vinyl tape extending 2 inches onto the cable jacket.

The above described splice is for a straight-through splice with continuity of shielding.

108-3.9 BARE COUNTERPOISE WIRE INSTALLATION AND GROUNDING FOR LIGHTNING PROTECTION. If shown in the Plans or specified in job specifications, a stranded bare copper wire, No. 8 AWG minimum size, shall be installed for lightning protection of the underground cables. The bare counterpoise wire shall be installed in the same trench for the entire length of the insulated cables it is designed to protect, and shall be placed at a distance of approximately 4 inches from the insulated cable. The counterpoise wire shall be securely attached to each light fixture base, or mounting stake. The counterpoise wire shall also be securely attached to copper or copper-clad ground rods installed not more than 1,000 feet apart around the entire circuit. The ground rods shall be of the length and diameter specified in the Plans, but in no case shall they be less than 8 feet long nor less than 5/8 inch in diameter.

The counterpoise system shall terminate at the transformer vault or at the power source. It shall be securely attached to the vault or equipment grounding system. The connections shall be made as shown in the project Plans and specifications.

108-3.10 GROUNDING SYSTEM. If shown in the Plans or specified in specifications, a stranded bare copper wire, No. 6~~8~~ AWG minimum size, shall be installed as grounding for the lighting system. The bare ground wire shall be installed in the same ~~trench~~ conduit and for the entire length of the insulated cables ~~or conduit it is designed to protect, and shall be placed at a distance of approximately 4 inches from the insulated cable or conduit~~. The ground wire shall be securely attached to each light fixture base. The ground wire shall also be securely attached to copper or copper-clad ground rods using exothermic connections and installed not more than 1,000 feet apart around the entire circuit. The ground rods shall be of the length and diameter specified in the Plans, but in no case shall they be less than 8 feet long nor less than 5/8 inch in diameter.

The ground system shall terminate at the transformer vault or at the power source. It shall be securely attached to the vault or equipment grounding system. The connections shall be made as shown in the project Plans and specifications.

108-3.11 TESTING. The Contractor shall furnish all necessary equipment and appliances for testing the underground cable circuits after installation. The Contractor shall test and demonstrate to the satisfaction of the Engineer the following:

a. That all lighting power and control circuits are continuous and free from short circuits.

b. That all circuits are free from unspecified grounds.

c. That the insulation resistance to ground of all nongrounded series circuits is not less than 50 megohms. Where additions to existing circuits, only the new section shall be tested. The resistance to ground of 600 V capacity shall be 10 megohms for the insulation test.

d. That the insulation resistance to ground of all non-grounded conductors of multiple circuits is not less than 50 megohms.

e. That all circuits are properly connected according to applicable wiring diagrams.

f. That all circuits are operable. Operate each control not less than 10 times and operate each lighting and power circuit continuously for not less than 1/2 hour.

METHOD OF MEASUREMENT

108-4.1 Trenching will not be measured for payment. Excavation, backfill, bedding, and reconditioning will be subsidiary.

108-4.2 Cable, ground or counterpoise wire by unit price installed in trench shall be measured by the number of linear feet of cable, ground or counterpoise wire installed in trenches, ready for operation, and accepted as satisfactory. Separate measurement will be made for each cable or counterpoise wire installed in trench.

108-4.3 Cable, ground or counterpoise wire, and interstice filler by unit price installed in duct or conduit shall be measured by the number of linear feet measured in place, completed, ready for operation, and accepted as satisfactory. Separate measurement will be made for each cable, ground or counterpoise wire installed in duct or conduit.

108-4.4 The quantity of ground rods to be paid for under this item shall be the number of ground rods in place, completed, ready for operation, and accepted as satisfactory.

108-4.5 Lump sum items will not be measured for payment.

BASIS OF PAYMENT

108-5.1 Payment will be made at the contract unit price or lump sum price for the items listed below and shown in the Bid Schedule.

Payment will be made under:

Item L-108a	Underground Cable, 8 AWG, copper, 5 kV FAA ~~type "B" or~~ type "C" ~~(as specified on Plans)~~, L-824 - per linear foot*
Item L-108b	Underground Cable [Gauge] AWG, copper, 5 kV FAA type "B" or type "C" (as specified on Plans), L-824 - per lump sum
Item L-108c	#6 Bare Copper Ground Conductor - per linear foot*
Item L-108d	[Gauge] Bare Copper Ground Conductor - per lump sum
Item L-108e	Underground Cable, 8 AWG Copper, 600 V, Type "C", L-824 - per linear foot*
Item L-108f	Underground Cable, [Gauge] AWG Copper, 600 V, Type "C", L-824 - per lump sum
Item L-108g	Ground Rod - per each
Item L-108h	Underground cable 6-pair, #19 AWG, shielded, copper, 600V, - per linear foot*

Item L-108i Underground cable #14 AWG, 2 Conductor, copper, 600V, Type "SOOW-A/SOOW", - per lump sum

Item L-108j Interstice Filler - per linear foot*

Item L-108k Interstice Filler - per lump sum

* For payment purposes, 4% will be added to the straight line measurements for cable and ground conductor wire.

MATERIAL REQUIREMENTS

AC 150/5345-7	*L-824 Underground Electrical Cable for Airport Lighting Circuits*
AC 150/5345-26	*L-823 Plug and Receptacle Cable Connectors*
ASTM B 3	Soft or Annealed Copper Wire
ASTM B 8	Concentric-Lay-Stranded Cooper Conductor, Hard, Medium-Hard, or Soft
ASTM D 4388	Rubber Tapes, Nonmetallic Semi-Conducting and Electrically Insulating
Commercial Item Description A-A-55809	Insulation Tape, Electrical, Pressure-Sensitive Adhesive, Plastic
Fed.Spec. J-C-30	Cable and Wire, Electrical Power, Fixed Installation
MIL-I 24391	Insulation Tape, Electrical, Plastic, Pressure Sensitive

ITEM L-109 TRANSFORMER VAULT AND VAULT EQUIPMENT

DESCRIPTION

109-1.1 This item shall consist of constructing an airport transformer vault, a prefabricated metal housing or an electrical enclosure according to these specifications and with the design and dimensions shown in the Plans. This work shall also include the installation of conduits in floor and foundation, painting and lighting of the vault, metal housing or enclosure and the furnishing of all incidentals necessary to produce a completed unit. Included as a separate part under this item or as a separate item where an existing structure (vault, metal housing, enclosure or building) is to be utilized shall be the furnishing of all vault equipment, wiring, electrical buses, cable, conduit, potheads, and grounding systems. This work shall also include the painting of equipment and conduit; the marking and labeling of equipment and the labeling or tagging of wires; the testing of the installation; and the furnishing of all incidentals necessary to place it in operating condition as a completed unit to the satisfaction of the Engineer.

EQUIPMENT AND MATERIALS

109-2.1 GENERAL. Obtain approval of all materials and equipment proposed for the work. Submit to the Engineer 5 complete listings of materials and equipment specified herein and on the Plans. The list shall be prepared to clearly identify the material or equipment by item, name, or designation used on the Plans or specifications and shall indicate where specified. The submittals shall be neatly bound, clearly indexed, and shall include applicable catalog number, cuts, wiring diagrams, performance data, operation and maintenance manuals, etc., for all material or equipment listed below or specified elsewhere in these specifications. In addition, wherever called for elsewhere in these specifications, include in the submittal certificates of compliance, manufacturer's instructions and/or shop drawings, or proposed construction or installation procedures. All materials of similar class or service shall be of one manufacturer. Capacities, sizes, and dimensions given are minimum unless otherwise indicated. All manufactured materials shall be delivered and stored in their original containers, which shall indicate clearly the manufacturer's name, brand, and identifying number.

a. Airport lighting equipment and materials covered by FAA specifications shall be certified and listed under AC 150/5345-53, Airport Lighting Equipment Certification Program. This AC, the latest certified equipment list, and the address list of certified airport lighting equipment manufacturers are available on the Internet home page for the FAA Office of the Associate Administrator for Airports (ARP). The internet address is http://www.faa.gov/airports_airtraffic/airports/construction/.

b. All other equipment and materials covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the Engineer.

109-2.2 CONCRETE. The concrete for the vault or electrical enclosure shall be proportioned, placed, and cured according to Item P-610, Structural Portland Cement Concrete, using 3/4 inch maximum size coarse aggregate.

109-2.3 REINFORCING STEEL. Reinforcing steel bars shall be intermediate or structural grade deformed-type bars and shall meet the requirements of AASHTO M 31.

109-2.4 BRICK. Brick shall conform to ASTM C 62, Grade SW.

109-2.5 ASBESTOS CEMENT DUCT. Asbestos cement duct and fittings shall be according to Fed. Spec. W-C-571.

109-2.6 RIGID STEEL AND INTERMEDIATE CONDUIT. Rigid steel conduit or intermediate conduit and fittings shall be according to UL Standard 6 and 514. They shall be galvanized on the outside. All fittings shall conform to the same specification as the conduit.

109-2.7 LIGHTING. Vault, metal-housing or electrical enclosure light fixtures shall be of a vaporproof type.

109-2.8 OUTLETS. Convenience outlets shall be heavy-duty duplex units designed for industrial service. Outlets shall be specification grade NEMA performance receptacles, grounding-type, AC rated 20 A, 125 V, 2-pole, 3-wire NEMA 5-20R, housed in device boxes with cover plates.

109-2.9 SWITCHES. Vault, metal-housing or electrical enclosure light switches shall be single-pole switches. Switches shall be NEMA Specification Grade Standard, 277 V (ac). Rated for inductive and fluorescent lamp loads, up to 20 A. Switches shall be of the type indicated by symbol on the Plans. Where more than 1 switch is shown at a point, they shall be set under 1 plate, unless otherwise noted.

109-2.10 PAINT.

a. Priming paint for ungalvanized metal surfaces shall be an ~~high solids~~ alkyd primer without lead and chromate pigments conforming to ~~TT-P-644D~~SSPC-Paint 25.

b. White paint for body and finish coats on metal and wood surfaces shall be ready-mixed paint conforming to ~~Commercial Item Description A-A-3067~~ the Master Painter's Institute, Reference #9, Exterior Alkyd, Gloss, BOC Range E2.

c. Priming paint for wood surfaces shall be mixed on the job by thinning the above specified white paint by adding 1/2 pint of raw linseed oil to each gallon of paint.

d. Paint for the floor, ceiling, and inside walls shall be ~~according to Fed. Spec. TT-E-487~~a urethane-modified alkyd floor enamel. Walls and ceiling shall be light gray and the floor shall be medium gray.

e. The roof coating for vault shall be hot asphalt material according to ASTM D 2823.

109-2.11 HIGH-VOLTAGE BUS. High-voltage bus shall be standard weight 3/8-inch IPS copper tubing or it may be insulated copper cable of the size and voltage rating specified.

109-2.12 BUS CONNECTORS. Connectors shall be similar to Burndy Type NT (or approved equal) for copper tubing. Connectors for insulated bus cable shall be of the proper size and type for the service intended.

109-2.13 BUS SUPPORTS. Bus supports shall be similar to Westinghouse No. 527892 (or approved equal), insulated for 7,500 volts, single clamp type for 2-bolt flat mounting.

109-2.14 GROUND BUS. Ground bus shall be 1/8 x 3/4 inch copper bus bar.

109-2.15 SQUARE DUCT. Duct shall be square similar to that manufactured by the Square D Company (or approved equal), or the Trumbull Electric Manufacturing Company (or approved equal). The entire front of the duct on each section shall consist of hinged or removable cover for ready access to the interior. The cross section of the duct shall be not less than 4 x 4 inches except where otherwise shown in the Plans.

109-2.16 GROUND RODS. Ground rods shall be copper-cladsteel, 3/4 inch x 10 feet, with copper alloy hex bolt type ground clamps.

109-2.17 POTHEADS. Potheads shall be similar to G&W Type NT, Shape C (or approved equal), unless otherwise specified. Potheads shall be furnished with plain insulator bushings and conduit couplings. Potheads shall have a rating not less than the circuit voltage.

109-2.18 PREFABRICATED METAL HOUSING. The prefabricated metal housing shall be a commercially available unit.

109-2.19 FAA-APPROVED EQUIPMENT. Certain items of airport lighting equipment installed in vaults are covered by individual FAA equipment specifications. The specifications are listed below:

AC 150/5345-3	L-821 Panels for Remote Control of Airport Lighting
AC 150/5345-5	Circuit Selector Switch
AC 150/5345-7	L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-10	Constant Current Regulators and Regulator Monitors
AC 150/5345-13	L-841 Auxiliary Relay Cabinet Assembly for Pilot Control of Airport Lighting Circuits

109-2.20 OTHER ELECTRICAL EQUIPMENT. Constant-current regulators, distribution transformers, oil switches, cutouts, relays, terminal blocks, transfer relays, circuit breakers, and all other regularly used commercial items of electrical equipment not covered by FAA equipment specifications shall conform to the applicable rulings and standards of the Institute of Electrical and Electronic Engineers or NEMA. When specified, test reports from a testing laboratory indicating that the equipment meets the specifications shall be supplied. In all cases, equipment shall be new and a first-grade product. This equipment shall be supplied in the quantities required for the specific project and shall incorporate the electrical and mechanical characteristics specified in the specifications and Plans.

109-2.21 WIRE. Wire in conduit rated up to 5,000 volts shall conform to AC 150/5345-7, Specification for L-824 Underground Electrical Cables for Airport Lighting Circuits, for rubber insulated neoprene-covered wire, or Fed. Spec. ~~J-C-30~~A-A-59544, Type RHW, for rubber insulated fibrous-covered wire. For ratings up to 600 volts, thermoplastic wire conforming to Fed. Spec. ~~J-C-30~~ A-A-59544, Types TW, THW, and THWN, shall be used. The wires shall be of the type, size, number of conductors, and voltage shown in the Plans or in the specifications.

a. **Control Circuits.** Wire shall be not less than No. 12 AWG and shall be insulated for 600 volts. If telephone control cable is specified, No. 19 AWG telephone cable conforming to ICEA S-85-625 specifications shall be used.

b. **Power Circuits.**

(1) 600 volts maximum: Wire shall be No. 6 AWG or larger and insulated for at least 600 volts.

(2) 3,000 volts maximum: Wire shall be No. 6 AWG or larger and insulated for at least 3,000 volts.

(3) Over 3,000 volts: Wire shall be No. 6 AWG or larger and insulated for at least the circuit voltage.

109-2.22 WOOD PLATFORM FOUNDATION. If a wood platform foundation is specified, the Contractor shall construct the platform as shown in the Plans. The floor system shall consist of urethane foam core insulated panels with interior and exterior surfaces or similar manufacturer to the building structure. The panels shall be constructed on grade beams of the size shown. Grade beams may be of timber or steel. Timber shall be Douglas Fir-Larch. Timbers shall be pressure treated according to the American Wood Preservers Bureau (AWPB) FDN Standard and shall bear AWPB Quality Mark of an approved inspection agency as described in the AWPB Standard. Preservative salt retention shall be not less than 0.6 lb/ft3. Wood shall be kiln dried after impregnation. Steel grade beams shall be hot-dipped galvanized according to ASTM A-123. The building shall be anchored with soil anchors meeting the requirements of Item P-650.

109-2.23 ELECTRICAL ENCLOSURE. The electrical enclosure shall be a pre-engineered structure with minimum dimensions shown on the Plans. The enclosure shall be installed on either a concrete slab or wood platform floor/foundation as shown on the Plans.

The enclosure shall meet the following requirements:

a. Panels and Facings.

(1) The enclosure may be constructed with separate interlocking panels forming the walls and roof or as a single unit. The enclosure exterior walls shall be foamed in place polyurethane core with 1/2 inch plywood on the interior surface. The exterior surface may be either 1/2 inch plywood with a 26 gauge galvanized steel exterior skin or, fiberglass reinforced polyester. The exterior color shall be a factory applied and shall be white.

(2) The side of the facings which contact the insulation core shall have a coating that will allow core-to-facing bond to be equal or greater than the cohesive strength of the core.

b. Insulation core.

(1) Factory foamed-in-place polyurethane between facings. Insulating value of the composite roof system shall be equal to or greater than R-38, and the wall system equal to or greater than R-19. No voids are allowed in the core.

(2) Polyurethane shall have a minimum 2 lbs/ft3 density.

(3) Polyurethane shall be certified UL flame spread 25 or less per ASTM E 84.

c. The panel joints shall have tongue and groove or ship lap interlock with continuous silicone sealant tape at interior and exterior faces.

d. Panels shall be full length in single piece where practical.

e. Panels shall have State Fire Marshals approval if floor area exceeds 300 square feet.

f. Metal flashing and trim at corners, intersections, openings, eaves and ridges shall be of the same finish and 24 gauge thickness to effect a neat appearing, weather tight joint and closure. Provide wrap-around door jamb trim-flashing.

g. Enclosure shall have a 12-inch x 12-inch louvered vent installed in one endwall.

h. A refrigerator style door(s) of the dimensions shown shall be provided for the enclosure. The door(s) shall be of similar construction to the enclosure. Mounting hardware shall be of stainless steel or of forged brass with chrome plating, Kason Industries No. 1053, or approved equal. Provide neoprene weather-stripping. The door(s) shall be provided with a refrigerator safety lock with pushrod from interior, Kason Industries, No. 56L, cast zinc with chrome plating. Provide lock(s) consisting of a brass, 6-pin E keyway padlock with a shackle that is 3/8 inch in diameter having a closed clearance of 2-1/4 inches. The lock shall have a control key removable core and shall have one separate replacement core. Provide 4 keys and 1 core removal key.

i. Enclosure construction shall meet the following.

Live Snow Load	70 psf
Live Floor Load	200 psf
Wind Load	110 mph, Basic wind speed, applied according to the International Building Code, Exposure Category D, Importance Factor III

Enclosure shall be an Equipment Enclosure for Runway Lighting Systems as manufactured by ALCEM, Inc., of Anchorage, Alaska; Plaschem Shelter as manufactured by Plaschem Supply & Consulting, of Anchorage Alaska; or approved equal.

j. Provide Metal Storage Cabinet and Wall Mounted Shop Desk. Provide 24 inch wide x 12 inch deep x 26 inch high wall mounted locking metal storage cabinet, and 24 inch wide x 23 inch deep x 12 inch high wall mounted shop desk securely fastened to the wall at the location and elevation shown on the drawings. Set bottom of desk surface 36 inches above floor surface. Mount cabinet above desk on wall. Cabinet and desk shall be a McMasters-Carr #5041T14 and #4894T26 respectively, or approved equal.

109-2.24 FLEXIBLE METAL CONDUIT. Conduit shall be water-tight, listed for exposed or direct bury per UL-360, as a grounding conductor per NEC Article 351-9, and rated for temperatures between -67 °F and +220 °F

109-2.25 TAPES.

a. Pipe sealing tape: "Scotch" No. 48, Teflon pipe sealing or approved equal.
b. Corrosion preventive tape: "Scotch" No. 50 or approved equal.
c. Electrical insulating tape: "Scotch" No. 88 or approved equal.

109-2.26 DOORS. Doors, unless otherwise specified, shall be metal-clad fireproof class a doors conforming to requirements of the NEC and local electrical codes.

109-2.27 RADIO CONTROL EQUIPMENT, L-854. Radio Control Equipment, shall be L-854, Type 1, with a receiver frequency set to the Common Traffic Advisory Frequency (CTAF) for the project airport as found in the Alaska Supplement of the U.S. Government Flight Publication.

109-2.28 ANTENNA FOR THE RECEIVER-CONTROLLER. Antenna shall be a heavy-duty omni-directional, tunable, ground plane antenna with vertical polarization in the 118 to 136 MHz band, designed for 100 mph winds. The antenna shall be tuned for the correct system frequency as assigned with a bandwidth of 2 MHz. The antenna shall be of 50 ohms nominal impedance and have an operating VSWR of less than 2:1 at system frequency. The antenna shall be equipped with an integral gap-type lightning arrester. The coaxial cable shall be 50-ohm, type RG-8. Antenna shall be designed to mount on 1-inch pipe support and shall be located on the Snow Removal Equipment Building as shown on the Plans. The antenna ground planes shall be a minimum of 4 feet above the top of the rotating beacon's lamp shields. Antenna mountings shall be fabricated as shown and noted.

109-2.29 APRON FLOODLIGHT. Apron floodlight shall be Hubbell Quartzliter Mod. QL-503 or approved equal, 300 W, 120 V, with wire guard .

109-2.30 PHOTO ELECTRICAL CONTROL. Photo electrical control shall be a SPST, 120 V, Tork No. 2100 or approved equal.

109-2.31 PANEL BOARDS. Panel boards shall be single phase, 3-wire, of sizes to provide all circuits and spares indicated. The branch breakers shall be bolt-in type. The enclosure shall be NEMA I with ~~door-in-~~ lockable flush door front, provided with a circuit index card under plastic on the interior side of the panel door; and the enclosure shall have an engraved phenolic label, lettered to indicate the voltage and current rating of the panel, attached to the panel front exterior.

The panel board circuit breakers shall be bolt-on molded case type, 120/240 V, 10,000 A interrupting capacity, with an insulation temperature rating of 60/75 °C or 75 °C to operate with conductors with insulation rated up to 75°C per NEC table 310-16, 1- and 2-pole type with current ratings as indicated on Plans. Each pole of the breaker shall provide inverse time delay and instantaneous circuit protection. Breakers shall be operated by toggle type handle and have a quick-make, quick-break over center switching mechanism that is mechanically trip free so that contacts cannot be held closed against short circuits and abnormal currents.

Tripping shall be clearly indicated. Non-interchangeable trip breakers shall have sealed covers and interchangeable trip units shall have sealed trip units. Ampere ratings shall be clearly visible.

Panel board circuit breakers shall be UL listed (where procedures exist), conform to the applicable requirements of the latest NEMA Standard ~~and meet the appropriate classifications of Federal Specifications W-A-375a~~. Breakers shall be standard thermal-magnetic type unless otherwise noted. Circuit breakers for the duplex receptacles shall incorporate overload, short circuit, and UL Class A ground fault circuit interruption.

109-2.32 TRANSFER SWITCH. Transfer switch shall be Heavy-duty, 2-pole, 3-wire, S/N, double-throw, non-fusible type in a NEMA I enclosure.

109-2.33 IDENTIFICATION TIES. Identification ties shall be self-locking, heavy duty nylon ties and shall be labeled by heat stamp.

109-2.34 SERVICE ENTRANCE EQUIPMENT. The meter/main breaker combination service entrance unit for the Electrical Equipment Enclosure shall be an overhead source or an underground source as shown on the Plans, bottom (under ground) load type, 125 A, 120/240 V, single phase, with 2-pole, 100 A, Q0M2100VH main breaker and 4-jaw kWh meter. The service entrance enclosure shall be raintight NEMA 3R rated with a conduit entry hub fitting on top.

The service entrance disconnect switch shall be mounted on the Snow Removal Equipment Building as shown on the Plans. Disconnect switch shall be 100 A, 240 V, 3-wire (third blade not used), S/N, with NEMA 3R enclosure, non-fused, with field installation kit.

109-2.35 PLUG CUTOUT. The plug cutout shall be a 2-pole type rated 20-amp @ 5kV, 60Hz. The plug shall be insertable in three positions for normal operations, maintenance, and testing. The plug cutout shall be mounted in a NEMA-1 enclosure with a hinged and lockable door sized to allow the plug and key to be operable by a worker standing in front of the enclosure.

109-2.36 SUPPORTS FOR WALL-MOUNTED PANELS, PANEL BOARDS, AND FIXTURES. Supports for wall mounted panels, panel boards and fixtures shall be metal channels with accessory nuts and fittings; Unistrut or approved equal, or 3/4 inch plywood panels.

109-2.37 PUSH-BUTTON STATIONS. Push-button stations shall be off-on, momentary-contact types in water/dust-tight boxes. Provide metal labels identifying the function of each section.

109-2.38 ELECTRIC HEATER. The electric heater shall be surface mounted and rated 2000 W at 240 V, with mounting kit as required. Thermostat shall be wall mounted on a suitable junction box and be of the line voltage type with an off position and a temperature range of 40 °F to 90 °F. Thermostat current rating shall be suitable to control the specified heater.

109-2.39 INDOOR LIGHTING FIXTURES. Indoor lighting fixtures shall be incandescent type with clear prismatic lens, surface mounted with steel extension box, and 100-W lamp.

109-2.40 HARDWARE. All miscellaneous hardware items, nails, bolts, and screws shall be galvanized steel.

CONSTRUCTION METHODS

CONSTRUCTION OF VAULT, PREFABRICATED METAL HOUSING AND ELECTRICAL ENCLOSURE

109-3.1 GENERAL. The Contractor shall construct the transformer vault, prefabricated metal housing or electrical enclosure at the location indicated in the Plans. Vault construction shall be reinforced concrete, concrete masonry, or brick wall as specified. The metal housing shall be prefabricated equipment enclosure to be supplied in the size specified. The electrical enclosure shall be a pre-engineered building placed on

either a poured concrete foundation or a wood platform as specified. The mounting pad or floor details, installation methods, and equipment placement are shown in the Plans.

If the vault, metal housing or electrical enclosure are to be placed on a site not prepared for that purpose under other items of work, the Contractor shall clear, grade, and seed the area around the vault, metal housing or electrical enclosure for a minimum distance of 10 feet on all sides. The slope shall be not less than 4% away from the vault, metal housing or electrical enclosure in all directions. Cost for site work will be considered incidental to this item and no separate payment will be made.

109-3.2 FOUNDATION AND WALLS.

a. **Reinforced Concrete Construction.** The Contractor shall construct the foundation and walls according to the details shown in the Plans. Unless otherwise specified, internal ties shall be of the mechanical type so that when the forms are removed the ends of the ties shall be at least 1 inch beneath the concrete surface; the holes shall be plugged and finished to prevent discoloration. Reinforcing steel shall be placed, as shown in the drawings, and secured in position to prevent displacement during the concrete placement.

   The external surfaces of the concrete shall be thoroughly worked during the placing operation to force all coarse aggregate from the surface. Thoroughly work the mortar against the forms to produce a smooth finish free from air pockets and honeycomb.

   The surface film of all pointed surfaces shall be removed before setting occurs. As soon as the pointing has set sufficiently, the entire surface inside and outside of the vault shall be thoroughly wet with water and rubbed with a No. 16 carborundum stone, or equal quality abrasive, bringing the surface to a paste. All form marks and projections shall be removed. The surface produced shall be smooth and dense without pits or irregularities. The materials which have been ground into a paste during the rubbing process shall be spread or brushed uniformly over the entire surface (except the interior surfaces that are to be painted shall have all paste removed by washing before painting) and permitted to reset. Final exterior finish shall be obtained by rubbing with No. 30 carborundum stone, or an equal quality abrasive. The surface shall be rubbed until the entire surface is smooth and uniform in color.

b. **Brick and Concrete Construction.** When this type of construction is specified, the foundation shall be concrete conforming to the details shown in the Plans. The outer edge of the foundation at the floor level shall be beveled 1-1/2 inches at 45 degrees. Brick walls shall be 8 inches thick, laid in running bond with every sixth course a header course. Brick shall be laid in cement mortar (1 part masonry cement and 3 parts sand) with full mortar bed and shoved joints. All joints shall be completely filled with mortar, and facing brick shall be back-parged with mortar as work progresses. All joints shall be 3/8 inch thick, exterior joints tooled concave, and interior joints struck flush. Both interior and exterior brick surfaces shall be cleaned and nail holes, cracks and other defects filled with mortar. When specified, a nonfading mineral pigment mortar coloring shall be added to the mortar. Steel reinforcing bars, 3/8 inch in diameter and 12 inches long, shall be set vertically in the center of the brick wall on not more than 2-foot centers to project 2-1/2 inches into the concrete roof slab. Lintels for supporting the brickwork over doors, windows, and louvers shall consist of two 4-inch x 3-inch x 3/8-inch steel angles. Lintels shall be painted with one coat of corrosion-inhibiting primer before installation, and all exposed parts shall be painted similar to doors and window sash after installation.

   Window sills may be concrete poured in place or precast concrete as indicated in the Plans. All exposed surfaces shall have a rubbed finish as specified under reinforced concrete construction. After completion, all interior and exterior faces of walls shall be scrubbed with a solution of muriatic acid and water in the proportions of not less than 1 part acid to 10 parts of water. All traces of efflorescence, loose mortar, and mortar stain shall be removed, and the walls washed down with clear water.

c. **Concrete Masonry Construction.** When this type of construction is specified, the foundation shall be concrete conforming to the details shown in the Plans. The concrete masonry units shall be standard sizes and shapes and shall conform to ASTM C 90 and shall include the closures, jambs, and other shapes required by the construction as shown in the Plans. Standard construction practice shall be followed for this type of work including mortar, joints, reinforcing steel for extensions into roof slab, etc. Plaster for interior walls, if specified, shall be portland cement plaster.

109-3.3 ROOF. The vault roof shall be reinforced concrete as shown in the Plans. Reinforcing steel shall be placed as shown in the drawing and secured in position to prevent displacement during the pouring of the concrete. The concrete shall be poured monolithically and shall be free of honeycombs and voids. The surface shall have a steel-troweled finish and shall be sloped as shown in the drawing. The underside of the roof slab shall be finished in the same manner as specified for walls.

One brush or mop coat of hot asphalt roof coating shall be applied to the top surface of the roof slab. The asphalt material shall be heated to within the range specified by the manufacturer and immediately applied to the roof. The finished coat shall be continuous over the roof surface and free from holidays and blisters. Smears and dribbles of asphalt on the roof edges and building walls shall be removed.

109-3.4 REINFORCED CONCRETE FLOOR. The floor shall be reinforced concrete as shown in the drawings either constructed on a previously prepared surface or on natural ground. When present, all sod, roots, refuse, and other perishable material shall be removed from the area under the floor to a depth of 8 inches, unless a greater depth is specified. This area shall be backfilled with materials consisting of sand, cinders, gravel, or stone. Fill shall be placed in layers not to exceed 4 inches and shall be thoroughly compacted by tamping or rolling. A layer of building paper shall be placed over the fill prior to placing concrete. The floor surfaces shall have a steel-troweled finish. The floor shall be level unless a drain is specified, in which case the floor shall be pitched 2% downward toward the drain. A 1/4-inch asphalt felt expansion joint shall be placed between floor and foundation walls. The floor shall be poured monolithically and shall be free of honeycombs and voids.

109-3.5 FLOOR DRAIN. If shown in the Plans, a floor drain and dry well shall be installed in the center of the floor of the equipment room. The dry well shall be excavated 4 foot x 4 foot square and to a depth of 4 feet below the finished floor elevation and shall be backfilled to the elevation of the underside of the floor with gravel which shall all pass a 2 inch mesh sieve and shall all be retained on a 1/4 inch mesh sieve. The gravel backfill shall be placed in 6 inch maximum layers, and the entire surface of each layer shall be tamped either with a mechanical tamper or with a hand tamper weighing not less than 25 pounds and having a face area of not more than 36 square inches nor less than 16 square inches. The drain inlet shall be set flush in the concrete floor. The drain shall have a clear opening of not less than 8 inches in diameter.

109-3.6 CONDUITS IN FLOOR AND FOUNDATION. Conduits shall be installed in the floor and through the foundation walls according to the details shown in the Plans. All underground conduit placed in concrete shall be painted with a bituminous compound. Conduit shall be installed with a coupling or metal conduit adapter flush with the top of the floor. All incoming conduit shall be closed with a pipe plug to prevent the entrance of foreign material during construction. Space conduit entrances shall be left closed.

109-3.7 PAINTING. The floor, ceiling, and inside walls of concrete construction shall first be given a hardening treatment, after which the Contractor shall apply two coats of paint as specified below, except that interior face brick walls need not be painted. The hardening treatment shall consist of applying two coats of either a commercial floor hardener or a solution made by dissolving 2 pounds of magnesium fluosilicate or zinc sulfate crystals in 1 gallon of water. Each coat shall be allowed to dry at least 48 hours before the next application. After the second treating coat has dried, the surfaces shall be brushed clean of all crystals and thoroughly washed with clear water. Paint for walls and ceiling shall be a light gray color approved by the Engineer. The floor paint shall be a medium gray color approved by the Engineer. Before painting, the surfaces shall be dry and clean. The first coat shall be thinned by adding 2/3 quart of spar varnish and 1/3 quart of turpentine to each gallon of paint. The second coat shall be applied without thinning. All doors, lintels, and windows shall be cleaned to remove any rust or foreign material and shall be given one body and

one finish coat of white paint. Bare metal surfaces shall be given a prime coat of corrosion-inhibiting primer prior to the body and finish coats.

109-3.9 LIGHTS AND SWITCHES. The Contractor shall furnish and install a minimum of two duplex convenience outlets in the vault room. Where a control room is specified, at least two duplex outlets shall be installed.

INSTALLATION OF EQUIPMENT IN VAULT, PREFABRICATED METAL HOUSING, ENCLOSURE OR BUILDING

109-3.10 GENERAL. The Contractor shall furnish, install, and connect all equipment, equipment accessories, conduit, cables, wires, buses, grounds, and support necessary to insure a complete and operable electrical distribution center for the airport lighting system as specified herein and shown in the Plans. When specified, an emergency power supply and transfer switch shall be provided and installed.

The equipment installation and mounting shall comply with the requirements of the NEC and local code agency having jurisdiction.

109-3.11 POWER SUPPLY EQUIPMENT. Transformers, regulators, booster transformers, and other power supply equipment items shall be furnished and installed at the location shown in the Plans or as directed by the Engineer. The power supply equipment shall be set on steel "H" sections, "I" beams, channels, or concrete blocks to provide a minimum space of 1-1/2 inches between the equipment and the floor. The equipment shall be placed so as not to obstruct the oil-sampling plugs of the oil-filled units; and name-plates shall, so far as possible, not be obscured. All equipment shall be securely anchored to the floor.

If specified in the Plans and specifications, equipment for an alternate power source or an emergency power generator shall be furnished and installed. The alternate power supply installation shall include all equipment, accessories, an automatic changeover switch, and all necessary wiring and connections. The emergency power generator set shall be the size and type specified.

109-3.12 SWITCHGEAR AND PANELS. Oil switches, fused cutouts, relays, transfer switches, panels, panel boards, and other similar items shall be furnished and installed at the location shown in the Plans or as directed by the Engineer. Wall or ceiling-mounted items shall be attached to the wall or ceiling with galvanized bolts of not less than 3/8 inch diameter engaging metal expansion shields or anchors in masonry or concrete vaults.

109-3.13 DUCT AND CONDUIT. The Contractor shall furnish and install square-type exposed metallic ducts with hinged covers for the control circuits in the vault. These shall be mounted along the walls behind all floor-mounted equipment and immediately below all wall-mounted equipment. The hinged covers shall be placed to open from the front side with the hinges at the front bottom.

Wall brackets for square ducts shall be installed at all joints 2 feet or more apart with intermediate brackets as specified. Conduit shall be used between square ducts and equipment or between different items of equipment when the equipment is designed for conduit connection. When the equipment is not designed for conduit connection, conductors shall enter the square-type control duct through insulating bushings in the duct or on the conduit risers.

109-3.14 CABLE ENTRANCE AND HIGH-VOLTAGE BUS SYSTEM. Incoming underground cable from field circuits and supply circuits will be installed outside the walls of the transformer vault as a separate item under Item L-108. The Contractor installing the vault equipment shall bring the cables from the trench or duct through the entrance conduits into the vault, cabinet or enclosure and make the necessary electrical connections. For the incoming and outgoing high voltage load circuits, the Contractor shall furnish and install rigid metallic vi conduit risers, surmounted by potheads, from floor level to the level as shown in the Plans.

The incoming high-voltage power supply service to the vault shall enter below the floor of the vault and shall rise from the floor level in a rigid metallic conduit riser, surmounted by a pothead, as described above. Using insulated high-voltage cable, the incoming power service shall be connected from the pothead to the oil-fused cutouts or to the specified disconnecting switch or equipment. From the oil-fused cutouts or disconnecting device, the insulated service conductors shall be connected to the overhead voltage bus system of the vault. The high-voltage bus system shall utilize the materials specified and shall be mounted and installed according to the requirements of the NEC or the local code agency having jurisdiction.

109-3.15 WIRING AND CONNECTIONS. The Contractor shall make all necessary electrical connections in the vault, cabinet or enclosure according to the wiring diagrams furnished and as directed by the Engineer. In wiring to the terminal blocks, the Contractor shall leave sufficient extra length on each control lead to make future changes in connections at the terminal block. This shall be accomplished by running each control lead the longest way around the box to the proper terminal. Leads shall be neatly laced in place.

109-3.16 MARKING AND LABELING. All equipment, control wires, terminal blocks, etc., shall be tagged, marked, or labeled as specified below:

a. **Wire Identification.** The Contractor shall furnish and install self-sticking wire labels or identifying tags on all control wires at the point where they connect to the control equipment or to the terminal blocks. Wire labels, if used, shall be of the self-sticking preprinted type and of the manufacturer's recommended size for the wire involved. Identification markings designated in the Plans shall be followed. Tags, if used, shall be of fiber not less than 3/4 inch in diameter and not less than 1/32 inch thick. Identification markings designated in the Plans shall be stamped on tags by means of small tool dies. Each tag shall be securely tied to the proper wire by a nonmetallic cord.

b. **Labels.** The Contractor shall stencil identifying labels on the cases of regulators, breakers, and distribution and control relay cases with white oil paint as designated by the Engineer. The letters and numerals shall be not less than 1 inch in height and shall be of proportionate width. The Contractor shall also mark the correct circuit designations according to the wiring diagram on the terminal marking strips which are a part of each terminal block.

109-3.17 GUARANTEE. Furnish a written guarantee that any materials or workmanship found defective within one year of final acceptance shall be replaced at no additional cost to the Department, promptly upon notifications and to the satisfaction of the Engineer.

METHOD OF MEASUREMENT

109-4.1 The quantity of vaults to be paid for under this item shall consist of the number of vaults constructed in place and accepted as a complete unit.

109-4.2 The quantity of prefabricated metal housings to be paid for under this item shall consist of the number of housings constructed in place and accepted as a complete unit.

109-4.3 The quantity of electrical enclosures to be paid for under this item shall consist of the number of enclosures constructed in place and accepted as a complete unit.

109-4.4 The quantity of electrical equipment installed in ~~an~~ a new or existing structure (vault, prefabricated metal housing electrical enclosure or building) to be paid for under this item shall consist of all equipment installed, connected, and accepted as a complete unit ready for operation.

BASIS OF PAYMENT

109-5.1 Payment will be made at the contract unit price for each completed and accepted vault, prefabricated metal housing or electrical enclosure.

109-5.2 Payment will be made at the contract unit price for equipment supplied and installed in a new or existing structure (vault, prefabricated metal housing, electrical enclosure or building) completed and accepted.

Payment will be made under:

Item L-109a	Transformer Vault in Place - per each
Item L-109b	Prefabricated Metal Housing and Foundation in Place - per each
Item L-109c	Electrical Enclosure and Foundation in Place - per each
Item L-109d	Installation of Electrical Equipment in New or Existing Structure - per each

MATERIAL REQUIREMENTS

AASHTO M 31	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
AC 150/5340-9	*Prefabricated Metal Housing for Electrical Equipment*
AC 150/5345-3	*L-821 Panels for Remote Control of Airport Lighting*
AC 150/5345-5	*Circuit Selector Switch*
AC 150/5345-7	*L-824 Underground Electrical Cable for Airport Lighting Circuits*
AC 150/5345-10	*Constant Current Regulators and Regulator Monitors*
AC 150/5345-13A	*L-841 Auxiliary Relay Cabinet Assembly for Pilot Control of Airport Lighting Circuits*
ANSI/ICEA S-85-625	Aircore, Polyethylene Insulated, Copper Conductor, Telecommunications Cable
ASTM C 62	Building Brick (Solid Masonry Units Made from Clay or Shale)
ASTM C 90	Concrete Masonry Units, Loadbearing
ASTM D 2823	Asphalt Roof-Coating
~~Commercial Item Description A-A-3067~~	~~Paint: Alkyd, Exterior, Low VOC~~
Fed.Spec.~~J-C-30~~ A-A-59544	Cable and Wire, Electrical (Power, Fixed Installation)
~~Fed. Spec. TT-E-487~~	~~Enamel, Floor and Deck~~
Fed.Spec.W-C-571	Conduit and Fittings, Nonmetal, Rigid; (Asbestos-Cement or Fire-Clay Cement), (For Electrical Purposes)
SSPC-Paint 25	Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel

ITEM L-110 UNDERGROUND ELECTRICAL DUCT

DESCRIPTION

110-1.1 This item shall consist of underground electrical ducts installed according to this specification at the locations and according to the dimensions, designs, and details shown in the Plans. This item shall include the installation of all underground electrical ducts or underground conduits. It shall also include all trenching, marking, backfilling, removal, and restoration of any paved areas; manholes, concrete encasement, mandreling installation of steel drag wires and duct markers, capping, and the testing of the installation as a completed duct system ready for installation of cables, to the satisfaction of the Engineer.

EQUIPMENT AND MATERIALS

110-2.1 GENERAL. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when so requested by the Engineer.

110-2.2 BITUMINOUS FIBER DUCT. Bituminous fiber duct and fittings shall conform to the requirements of UL Standard 543.

a. Type I, for concrete encasement.
b. Type II, for direct burial.

110-2.3 ASBESTOS CEMENT DUCT. Asbestos cement duct and fittings shall conform to the requirements of Fed. Spec. W-C-571 and shall be one of the following, as specified in the proposal:

a. Type I, for concrete encasement.
b. Type II, for direct burial.

110-2.4 STEEL CONDUIT. Rigid steel conduit and fittings shall conform to the requirements of UL Standard 6, 514, and 1242.

110-2.5 CONCRETE. Concrete shall conform to Item P-610, Structural Portland Cement Concrete, 1 inch maximum size coarse aggregate.

110-2.6 PLASTIC CONDUIT. Plastic conduit and fittings shall conform to the requirements of Fed. Spec. W-C-1094 Type I, suitable for underground use either directly in the earth or encased in concrete. The conduit shall be one of the following as shown on the Plans:

a. Underground Plastic Duct shall be rigid, non-metallic, conduit, Schedule 40 PVC conforming to UL Standard 651 and NEMA TC-2, nominal size as indicated on the Plans. All fittings such as elbows, couplings, connectors, expansion joints, adapters, etc., used in the installation shall be Schedule 40 PVC conforming to UL Standard 514 and NEMA TC-3.

b. Underground Plastic Duct shall be Type III, rigid, HDPE pipe, schedule 40. The material shall have a cell classification of 334420C or better according to ASTM D 3350, and shall have a third party, nationally recognized testing lab listing. The nominal size shall be as indicated on the Plans ~~with a minimum wall thickness of 5/32 inch~~. All fittings such as saddle fittings, elbows, couplings, connectors, adapters, etc., used in the installation shall be HDPE and shall be of the same material as the duct.

110-2.7 FLEXIBLE METAL CONDUIT. Flexible metal conduit shall be water-tight, listed for exposed or direct bury per UL-360, as a grounding conductor per NEC Article 351-9, and rated for temperatures between -67 °F and +220 °F.

110-2.8 TAPES.

a. Pipe sealing tape shall be Teflon, "Scotch" No. 48 or approved equal.
b. Corrosion preventive tape shall be "Scotch" No. 50 or approved equal.

CONSTRUCTION METHODS

110-3.1 GENERAL. The Contractor shall install underground ducts at the approximate locations indicated in the airport layout plans. The Engineer shall indicate specific locations as the work progresses. Ducts shall be of the size, material, and type indicated in the Plans or specifications. Where no size is indicated in the Plans or specifications, the ducts shall be not less than 3 inches inside diameter. All duct lines shall be laid so as to grade toward handholes, manholes and duct ends for drainage. Grades shall be at least 3 inches per 100 feet. On runs where it is not practicable to maintain the grade all one way, the duct lines shall be graded from the center in both directions toward manholes, handholes, or duct ends. Pockets or traps where moisture may accumulate shall be avoided.

Seal all joints in the rigid steel conduit runs with Teflon pipe sealing tape applied to the threaded couplings. Wrap the completed joint with 2 layers of corrosion preventative tape, 1/2 lapped and extending 1-1/2 inches on both sides of the joints.

After the conduit run has been completed, pull a standard flexible mandrel not less than 12 inches long, having a diameter approximately 1/4 inch less than the inside diameter of the conduit, through the entire length of the conduit run, after which a brush with stiff bristles of at least the diameter of the inside of the conduit shall be pulled through the entire length of the conduit run to make certain that no particles of earth, sand, or gravel have been left in the line.

All ducts installed shall be provided with a No. 10 gauge galvanized iron or steel drag wire for pulling the permanent wiring. Sufficient length shall be left in manholes or handholes to bend the drag wire back to prevent it from slipping back into the duct. Where spare ducts are installed, as indicated on the Plans, the open ends shall be plugged with removable tapered plugs, designed by the duct manufacturers, or with hardwood plugs conforming accurately to the shape of the duct and having the larger end of the plug at least 1/4 inch greater in diameter than the duct.

All ducts shall be securely fastened in place during construction and progress of the work and shall be plugged to prevent seepage of grout, water, or dirt. Any duct section having a defective joint shall not be installed.

All ducts, except steel conduit, installed under runways, taxiways, aprons, and other paved areas shall be encased in a concrete envelope.

Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

Trenches for ducts may be excavated manually or with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of road patrols or graders shall not be used to excavate the trench. The Contractor shall ascertain the type of soil or rock to be excavated before bidding. All excavation shall be unclassified.

Trenches for burial of duct or conduit shall be of sufficient width to provide a minimum of 2 inches of lateral clearance between the duct or conduit and trench walls on both sides ~~as shown on the Plans~~. Trenches for burial of duct or conduit shall be of sufficient depth as to assure 1.5 feet minimum duct or conduit burial depth below finished grade, plus ~~2~~ 4 inches minimum of below duct or conduit bedding ~~as shown on the Plans~~, plus adequate over excavation depth as required to slope and grade all duct or conduit installations to drain toward light bases or hand holes.

~~The bottom of all trenches shall be sloped and lined with a layer of bedding material of minus 1/4-inch material that is not less than 2 inches in depth, before placing any duct or conduit in the trenches. Bedding~~

~~material shall be, sand, gravel, crushed aggregate, or other suitable material containing no organic, frozen, or other deleterious material.~~

Excavate foundations, footings, slabs, pads, manholes, handholes, ducts and/or duct banks, or light base assemblies so as to permit the placing or construction of the full width, length, and depth of the structure or object and the layer of bedding material, whenever bedding is required.

110-3.2 DUCTS ENCASED IN CONCRETE. Unless otherwise shown in the Plans, concrete-encased ducts shall be installed so that the top of the concrete envelope is not less than 1.5 feet below the finished subgrade where installed under runways, taxiways, aprons, or other paved areas, and not less than 1.5 feet below finished grade where installed in unpaved areas. Ducts under paved areas shall extend at least 3 feet beyond the edges of the pavement or 3 feet beyond any underdrains which may be installed alongside the paved area. Trenches for concrete-encased ducts shall be opened the complete length before concrete is laid so that if any obstructions are encountered, proper provisions can be made to avoid them. All ducts for concrete encasements shall be placed on a layer of concrete not less than 3 inches thick prior to its initial set. Where two or more ducts are encased in concrete, the Contractor shall space them not less than 1-1/2 inches apart (measured from outside wall to outside wall) using spacers applicable to the type of duct. As the duct laying progresses, concrete not less than 3 inches thick shall be placed around the sides and top of the duct bank. End bells or couplings shall be installed flush with the concrete encasement where required.

When specified, the Contractor shall reinforce the bottom side and top of encasements with steel reinforcing mesh or fabric or other approved metal reinforcement. When directed, the Contractor shall supply additional supports where the ground is soft and boggy, where ducts cross under roadways, or where otherwise shown on the Plans under such conditions, the complete duct structure shall be supported on reinforced concrete footings, piers, or piles located at approximately 5-foot intervals.

When clay or soapstone ducts are specified, they shall be installed with concrete encasement as described above. Clay conduit shall be of the single-bore type. Where the self-centering socket-joint type of single clay duct is used, conduit shall be built up, tier by tier, and separated only by sufficient mortar or fine aggregate concrete to bed the ducts evenly and fill all voids between ducts. Single ducts shall be jointed together and the joints grouted with Portland cement mortar. A suitable gasket (of rubber or other approved material) shall first be placed in the receptacle end of the duct, prior to the joining operation, in order to exclude all mortar from the duct.

Where the square bore butt joint type of clay duct, single or multicell, is used, sections shall be aligned with at least 4 steel dowel pins and joints wrapped with duct tape 6 inches wide and lapped 6 inches. All joints in a bank of single-bore ducts shall be staggered, beginning evenly from the manhole or handhole, by means of short lengths 6, 8, 9, 12, and 15 inches long. Cement mortar shall be troweled around each and every joint. Voids in the duct bank, caused by the external shape of the corners of the conduit, shall also be filled with mortar. The joining and joints of soapstone duct shall be done according to the manufacturer's recommendations.

110-3.3 DUCTS WITHOUT CONCRETE ENCASEMENT. Trenches for single-duct lines shall be not less than 6 inches nor more than 12 inches wide, and the trench for 2 or more ducts installed at the same level shall be proportionately wider. Trench bottoms for ducts without concrete encasement shall be made to conform accurately to grade so as to provide uniform support for the duct along its entire length.

A layer of ~~sand~~ bedding material, at least 4 inches thick (loose measurement) shall be placed in the bottom of the trench as bedding for the duct. ~~The bedding material shall consist of sand.~~ Bedding material shall be, sand, gravel, crushed aggregate, or other suitable material containing no organic, frozen, or other deleterious material and it shall contain no particles that would be retained on a 1/4-inch sieve. The bedding material shall be tamped until firm.

Unless otherwise shown in Plans, ducts for direct burial shall be installed so that the tops of all ducts are at least 1.5 feet below the finished grade.

When two or more ducts are installed in the same trench without concrete encasement, they shall be spaced not less than 2 inches apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches apart in a vertical direction.

Trenches shall be opened the complete length before duct is installed so that if any obstructions are encountered, proper provisions can be made to avoid them.

110-3.4 PVC CONDUIT. Install PVC conduit where indicated on the Plans.

Fabricate the conduit runs as recommended by the conduit manufacturer. Make all joints square, tight, and leakproof. Do not allow bends or breaks in the joints. Use only solvents and cements, which are specifically recommended by the conduit manufacturer. Join together the complete run between each light base alongside the trench. Place in the trench and connect to the base assembly after the minimum cure time of the joint cement has elapsed and after inspection and approval is granted by the Engineer.

Make field cuts of the conduit true and square with a tool or lathe designed for the purpose. Debur and ream the conduit as required.

Bend PVC conduit at the job site only with a "Hot Box" or as recommended by the conduit manufacturer. Heat the conduit uniformly to obtain smooth bends without overheating. Conduit with a brown appearance shall not be used. Conduit with extremely sharp bends, kinks in the bends or which exhibits a significant visual defect shall not be used.

Install expansion fittings in each run of conduit between light base assemblies, at spacing not exceeding 60 feet. The expansion fitting shall be of the same manufacturer as the conduit and shall be installed according to the manufacturer's instruction. Expansion joints shall be installed a maximum of 10 feet from the edge light bases or hand holes and shall be installed with joints 1/4 inch expanded, resulting in a minimum requirement of four expansion joints per 190-foot run of conduit.

After the conduit run has been completed, pull a standard flexible mandrel not less than 12 inches long, having a diameter approximately 1/4 inch less than the inside diameter of the conduit, through the entire length of the conduit run, after which a brush with stiff bristles of at least the diameter of the inside of the conduit shall be pulled through the entire length of the conduit run to make certain that no particles of earth, sand, or gravel have been left in the line.

110-3.5 HDPE CONDUIT. Assemble high-density polyethylene conduit into runs on the surface and install in trenches after coupling of the section. Butt-weld the duct using the manufacturer's recommended procedures and equipment. Assure that the conduit is open, continuous and free of water and debris prior to installing cable. In underground conduit, pull a stiff bristle brush through the entire length of the conduit run immediately prior to the cable being installed.

110-3.6 DUCT MARKERS. Place marker tape 0.5 foot below final grade or below bottom of Crushed Aggregate Base Course in paved areas for the full length of the trenches above all ducts installed as indicated on the Plans.

When called for in the Plans, the location of the ends of all ducts shall be marked by a concrete slab marker 2 feet square and 4 inches thick extending approximately 1 inch above the surface. The markers shall be located above the ends of all ducts or duct banks, except where ducts terminate in a handhole, manhole, or building.

The Contractor shall impress the word “DUCT” on each marker slab, and shall also impress on the slab the number and size of ducts beneath the marker. The letters shall be 4 inches high and 3 inches wide with width of stroke 1/2 inch and 1/4 inch deep or as large as the available space permits.

110-3.7 BACKFILLING. Backfill only after the duct has been placed, inspected and accepted by the Engineer.

After concrete-encased ducts have been properly installed and the concrete has had time to set, the trench shall be backfilled in at least two layers with excavated material not larger than 2 inches in diameter and thoroughly tamped and compacted to at least the density of the surrounding undisturbed soil. If necessary to obtain the desired compaction, the backfill material shall be moistened or aerated as required. If duct is placed in the structural section (P-154, P-208, P-209) of a pavement such as for a runway or taxiway, the Contractor shall construct the backfill according to the specifications for the material in which the duct is placed.

Trenches shall not be excessively wet and shall not contain pools of water during backfilling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface: except that, when sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of according to instructions issued by the Engineer.

For ducts without concrete envelope, sand shall be placed around the ducts and carefully tamped around and over them with hand tampers. Sand shall be non frost susceptible with no particle larger than 1/4 inch. Sand shall be placed to provide a minimum of 2 inches of cover when compacted over and to the sides of the duct. The remaining trench may be filled with regular run of excavated material and thoroughly tamped as specified above. If duct is placed in the structural section (P-154, P-208, P-209) of a pavement such as for a runway or taxiway, the Contractor shall construct the backfill according to the specifications for the material in which the duct is placed.

110-3.8 RESTORATION. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the trenching, storing of dirt, cable laying, pad construction and other work shall be restored to its original condition. The restoration shall include any necessary topsoil, fertilizing, liming, seeding, sprigging, or mulching. All such work shall be performed according to the FAA Standard Turfing Specifications. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance.

METHOD OF MEASUREMENT

110-4.1 Underground duct shall be measured by the linear foot of duct installed, measured in place, completed, and accepted. Separate measurement shall be made for the various types and sizes.

Items shown as lump sum will not be measured for payment.

BASIS OF PAYMENT

110-5.1 Payment will be made at the contract unit price for each type and size of single-way or multi-way duct completed and accepted. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item L-110a ~~2-1/8~~ 2-inch Rigid Steel Conduit - per linear foot

Item L-110b ~~2-1/8~~ 2-inch Rigid Steel Conduit - per lump sum

Item L-110c ~~4~~2-inch Rigid Steel~~PVC~~ Conduit - per linear foot

Item L-110d 2-inch PVC Conduit - per lump sum

Item L-110e	1-1/4 inch PVC Conduit - per linear foot
Item L-110f	1-1/4 inch PVC Conduit - per lump sum
Item L-110g	2-inch PE Conduit - per linear foot
Item L-110h	2-inch PE Conduit - per lump sum
Item L-110i	Multi-Way Duct in Concrete (# of conduit) - per linear foot
Item L-110j	Multi-Way Duct in Concrete (# of conduit) - per lump sum
Item L-110y	4-inch Rigid Steel Conduit – per linear foot

MATERIAL REQUIREMENTS

Fed. Spec. W-C-571	Conduit and Fittings, Nonmetal, Rigid; (Asbestos-Cement or Fire-Clay Cement), (For Electrical Purposes)
Fed. Spec. W-C-1094	Conduit and Fittings; Nonmetallic, Rigid, (Plastic)
UL Standard 6	Rigid Metal Conduit
UL Standard 514	Fittings for Conduit and Outlet Boxes
UL Standard 543	Impregnated-Fiber Electrical Conduit
UL Standard 1242	Intermediate Metal Conduit

ITEM P-151 CLEARING AND GRUBBING

DESCRIPTION

151-1.1 This item shall consist of clearing or clearing and grubbing, including the disposal of materials, for all areas within the limits designated on the Plans or as required by the Engineer.

Clearing shall consist of the cutting and removal of all trees, stumps, brush, logs, hedges, the removal of fences and other loose or projecting material from the designated areas. The grubbing of stumps and roots will not be required.

Clearing and grubbing shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which in the opinion of the Engineer is unsuitable for the foundation of strips, pavements, or other required structures, including the grubbing of stumps, roots, matted roots, foundations, and the disposal from the project of all spoil materials resulting from clearing and grubbing by burning or otherwise.

Selective tree removal requires the hand cutting (topping) of all types of trees either by chain saw or by other approved conventional hand clearing methods. Lay the fallen tree next to the stump.

CONSTRUCTION METHODS

151-2.1 GENERAL. The areas ~~denoted on the Plans~~ to be cleared or cleared and grubbed shall be staked or otherwise marked on the ground at the direction of the Engineer. The Engineer will flag or mark each tree designated for selective tree removal. The clearing and grubbing shall be done far enough ahead of the earthwork operation to permit cross-sectioning prior to excavation or embankment. Mechanical brush cutting equipment may be used for clearing. Dozers or other mechanical equipment not specifically designed for brush cutting may not be used.

Comply with seasonal construction limitations in subsection 80-04 to prevent impacts to migratory bird nesting areas.

Debris from mechanical brush cutting equipment less than 4 feet long by 4 inches in diameter may remain in place outside of Runway and Taxiway Safety Area surfaces except as specified in areas to be embanked. All other spoil materials generated by clearing or by clearing and grubbing shall be disposed of by burning, when permitted by local laws, or by removal to approved disposal areas. When burning of material is permitted, it shall be burned under the constant care of competent watchmen so that the surrounding vegetation and other adjacent property will not be jeopardized. Burning shall be done according to all applicable laws, ordinances, and regulations. Before starting any burning operations, the Contractor shall notify the agency having jurisdiction.

As far as practicable, waste concrete and masonry shall be placed on slopes of embankments or channels. When embankments are constructed of such material, this material shall be placed according to requirements for formation of embankments. Any broken concrete or masonry which cannot be used in construction, and all other materials not considered suitable for use elsewhere, shall be disposed of by the Contractor. In no case shall any discarded materials be left in windrows or piles adjacent to or within the airport limits. The manner and location of disposal of materials shall be subject to the approval of the Engineer and shall not create an unsightly or objectionable view. When the Contractor is required to locate a disposal area outside the airport property limits at their own expense, the Contractor shall obtain and file with the Engineer, permission in writing from the property owner for the use of private property for this purpose.

If the Plans or the Specifications require the saving of merchantable timber, the Contractor shall trim the limbs and tops from designated trees, saw them into suitable lengths, and make the material available for removal by others.

Any blasting necessary shall be done at the Contractor's responsibility, and the utmost care shall be taken not to endanger life or property.

The Contractor shall remove existing structure and utilities that are identified to be removed or demolished, except when another entity is identified in the Contract to accomplish the work.

151-2.2 CLEARING. The Contractor shall clear the staked or indicated area of all objectionable materials. Trees unavoidably falling outside the specified limits must be cut up, removed, and disposed of in a satisfactory manner. In order to minimize damage to trees that are to be left standing, trees shall be felled toward the center of area being cleared. The Contractor shall preserve and protect from injury all trees not to be removed. The trees, stumps, and brush shall be cut to a height of not more than 12 inches above the ground. The grubbing of stumps and roots will not be required.

Fences shall be removed and disposed of when directed by the Engineer. Fence wire shall be neatly rolled and the wire and posts stored on the airport if they are to be used again, or stored at a designated location if the fence is to remain the property of a local owner.

151-2.3 CLEARING AND GRUBBING. In areas designated to be cleared and grubbed, all stumps, roots, buried logs, brush, grass, and other unsatisfactory materials shall be removed, except where embankments exceeding 4.0 feet in depth are to be made outside of paved areas. In cases where such depth of embankments is to be made, all unsatisfactory materials shall be removed, but sound trees, stumps, and brush can be cut off within 6 inches above the ground and allowed to remain. Tap roots and other projections over 1.5 inches in diameter shall be grubbed out to a depth of at least 18 inches below the finished subgrade or slope elevation.

Any buildings and miscellaneous structures that are shown on the Plans to be removed shall be demolished or removed, and all materials therefrom shall be disposed of either by burning or otherwise removed from the site. The remaining or existing foundations, wells, cesspools, and all like structures shall be destroyed by breaking down the materials of which the foundations, wells, cesspools, etc., are built to a depth at least 2 feet below the existing surrounding ground. Any broken concrete, blocks, or other objectionable material which cannot be used in backfill shall be removed and disposed of. The holes or openings shall be backfilled with acceptable material and properly compacted.

All holes remaining after the grubbing operation in embankment areas shall have the sides broken down to flatten out the slopes, and shall be filled with suitable material, moistened and properly compacted in layers to the density required in Item P-152. The same construction procedure shall be applied to all holes remaining after grubbing in excavation areas where the depth of holes exceeds the depth of the proposed excavation.

METHOD OF MEASUREMENT

151-3.1 Measure according to Section GCP-90 and the following:

a. **Acre.** The area acceptably cleared, or cleared and grubbed, measured on the ground surface. Only areas shown on the Plans, or areas cleared at the Engineer's direction will be measured. Islands of existing cleared areas, such as lakes, ponds, existing stream beds, and roads and trails within the clearing limits of more than 60 square yards will not be included as pay areas.

b. **Each.** The number of designated trees acceptably removed, regardless of size.

BASIS OF PAYMENT

151-4.1 ~~The accepted quantities of clearing or clearing and grubbing will be paid for at the contract unit price, per unit of measurement~~At the contract lump sum or unit price, for each of the pay items listed below that are shown in the bid schedule.

Payment will be made under:

Item P-151a	Clearing - per acre
Item P-151b	Clearing - lump sum
Item P-151c	Clearing & Grubbing - per acre
Item P-151d	Clearing & Grubbing - lump sum
Item P-151e	Selective Tree Removal – per each

ITEM P-152 EXCAVATION 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, logs, 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.

152-2.2 UNSUITABLE MATERIAL. Material that doesn't meet the testing criteria 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 Subsection GCP 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 Subsection GCP 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 Subsection GCP 70-11.d. 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 defined in AC 150/5300-13, Subsection 306).

   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 Subsection GCP 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 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, or to the depth directed by the Engineer, below the top of subgrade. 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 refilled with suitable material, obtained from the grading operations or borrow areas and thoroughly compacted as specified. Where rock cuts are made and refilled 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. The Engineer shall determine if the displacement of such material was unavoidable and their decision shall be final. All overbreak shall be graded or removed by the Contractor and disposed of as directed; however, payment will not be made for the removal and disposal of overbreak which the Engineer determines as avoidable. Unavoidable overbreak that must be removed 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 ~~100% for non-cohesive soils (95% for cohesive soils)~~ 95% of the maximum density as determined by WAQTC FOP for AASHTO T 99/T 180 or ATM 212. The in-place field density and moisture content shall be determined according to WAQTC FOP for AASHTO T 310. ~~The in-place~~

~~moisture shall be determined by WAQTC FOP for AASHTO T 255/T 265 when using other than the nuclear gauge method for density.~~

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 Subsection GCP 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 debri, 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 ~~on airport property~~, the Safety Plan and the Blasting Plan shall conform to Executive Order 7400.2~~G~~E *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 are 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 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 fills; unsuitable material shall be placed in waste areas or as directed. 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.

152-3.5 PREPARATION OF EMBANKMENT AREA. Where an embankment is to be constructed to a height of 4 feet or less, or where the embankment supports asphalt or concrete paving, all sod and vegetable matter shall be removed from the surface upon which the embankment is to be placed, and the cleared surface shall be completely broken up by plowing or scarifying to a minimum depth of 6 inches. Compact this area as indicated in Subsection 152-3.2.e.

When new embankment is placed against existing embankments or 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. 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 ±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 WAQTC FOP for AASHTO T 99/T 180 or ATM 212. Under all areas serving aircraft or vehicle traffic loadings, the embankment shall be compacted ~~to the depth shown on the Plans and~~ to a density of not less than 100% of the maximum density as determined by WAQTC FOP for AASHTO T 99/T 180 or ATM 212. The in-place field density and moisture content shall be determined according to WAQTC FOP for AASHTO T 310. ~~The in-place moisture shall be determined by WAQTC FOP for AASHTO T 255/T 265 when using other than the nuclear gauge method for density.~~

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 2 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, disking, 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 RESERVED

152-3.9 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.

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, by weighing system or by barge displacement method.

BASIS OF PAYMENT

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.

152-5.1 For "Unclassified Excavation" payment will be made at the contract unit price per cubic yard.

152-5.2 For "Common Excavation" payment will be made at the contract unit price per cubic yard.

152-5.3 For "Rock Excavation" payment will be made at the contract unit price per cubic yard.

152-5.4 For "Muck Excavation" payment will be made at the contract unit price per cubic yard.

152-5.5 For "Drainage Excavation" payment will be made at the contract unit price per cubic yard.

152-5.6 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 P-152a	Unclassified Excavation - per cubic yard
Item P-152a(1)	Common Excavation - per cubic yard
Item P-152b	Rock Excavation - per cubic yard
Item P-152c	Muck Excavation - per cubic yard
Item P-152d	Drainage Excavation - per cubic yard
Item P-152e	Reserved
Item P-152f	Reserved
Item P-152g	Reserved
Item P-152h(1)	Borrow measured at Source- per cubic yard
Item P-152h(2)	Borrow measured in Final Position- per cubic yard
Item P-152i	Borrow - per ton

TESTING REQUIREMENTS

ATM 212	Standard Density of Coarse Granular Materials using the Vibratory Compactor
WAQTC FOP for AASHTO T 99/T 180	Moisture-Density Relations of Soils
WAQTC FOP for AASHTO T 255/T 265	Moisture Content of Aggregate and Soils
WAQTC FOP for AASHTO T 310	In-place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods

ITEM P-154 SUBBASE COURSE

DESCRIPTION

154-1.1 This item shall consist of a subbase course composed of granular materials constructed on a prepared subgrade or underlying course according to these Specifications, and in conformity with the dimensions and typical cross section shown on the Plans.

MATERIALS

154-2.1 MATERIALS. The subbase material shall consist of hard durable particles or fragments of granular aggregates. This material will be mixed or blended with fine sand, clay, stone dust, or other similar binding or filler materials produced from approved sources. This mixture must be uniform and shall comply with the requirements of these Specifications as to gradation, soil constants, and shall be capable of being compacted into a dense and stable subbase. The material shall be free from vegetable matter, lumps or excessive amounts of clay, and other objectionable or foreign substances. ~~The coarse aggregate shall have a minimum degradation value of 40 when tested according to ATM 313 and a percent of wear not more than 50 at 500 revolutions as determined by AASHTO T 96.~~ Pit-run material may be used, provided the material meets the requirements specified.

Aggregate gradation shall meet the requirements of Table 1, determined according to WAQTC FOP for AASHTO T 27/T11.

TABLE 1. AGGREGATE GRADATION REQUIREMENTS

Sieve designation (Square opening)	**Percentage by weight passing sieves**
3 inch	90-100
No. 4	20-55
~~No. 8~~	~~30-70~~
~~No. 50~~	~~0-30~~
No. 200	0-6

The percent passing the No. 200 sieve will be determined on minus 3-inch material.

The portion of the material passing the No. 40 sieve shall have a liquid limit of not more than 25 and a plasticity index of not more than 6 when tested according to WAQTC FOP for AASHTO T 89 and T 90.

The gradations 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.

CONSTRUCTION METHODS

154-3.1 GENERAL. The subbase course shall be placed where designated on the Plans or as directed by the Engineer. The material shall be shaped and thoroughly compacted within the tolerances specified.

Granular subbases which, due to grain sizes or shapes, are not sufficiently stable to support the movement of construction equipment, shall be mechanically stabilized to the depth necessary to provide such stability as directed by the Engineer. The mechanical stabilization shall principally include the addition of a fine-grained medium to bind the particles of the subbase material sufficiently to furnish a bearing strength, so that the course will not deform under the traffic of the construction equipment. The addition of the binding medium to the subbase material shall not increase the soil constants of that material above the limits specified.

154-3.2 PREPARING UNDERLYING COURSE. Before any subbase material is placed, the underlying course shall be prepared and conditioned as specified. The course shall be checked and accepted by the Engineer before placing and spreading operations are started.

To protect the subgrade and to ensure proper drainage, the spreading of the subbase shall begin along the centerline of the pavement on a crowned section or on the high side of pavements with a one-way slope.

154-3.3 MATERIALS ACCEPTANCE IN EXISTING CONDITION. When the entire subbase material is secured in a uniform and satisfactory condition, such approved material may be moved directly to the spreading equipment for placing. The material may be obtained from gravel pits, stockpiles, or may be produced from a crushing and screening plant with the proper blending. The materials from these sources shall meet the requirements for gradation, quality, and consistency. The moisture content of the material shall be approximately that required to obtain maximum density. The final operation shall be blading or dragging, if necessary, to obtain a smooth uniform surface true to line and grade.

154-3.4 GENERAL METHODS FOR PLACING. When materials from several sources are to be blended and mixed, the subbase material, together with any blended material, shall be thoroughly mixed prior to placing on grade.

The subbase course shall be constructed in layers. Any layer shall be not less than 3 inches nor more than 8 inches of compacted thickness. The material, as spread, shall be of uniform gradation with no pockets of fine or coarse materials. No material shall be placed in snow or on a soft, muddy, or frozen course.

When more than one layer is required, the construction procedure described herein shall apply similarly to each layer.

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

154-3.5 FINISHING AND COMPACTING. After spreading or mixing, the subbase material shall be thoroughly compacted. Sufficient compactors shall be furnished to adequately handle the rate of placing and spreading of the subbase course. The moisture content of the material shall be approximately that required to obtain maximum density.

The field density of the compacted material shall be not less than 100% of the maximum density, as determined according to WAQTC FOP for AASHTO T 99/T 180 or ATM 212. ~~According to~~ The in-place field density and moisture content shall be determined according to WAQTC FOP for AASHTO T 310.

The course shall not be rolled when the underlying course is soft or yielding or when the rolling causes undulation in the subbase. When the rolling develops irregularities that exceed 1/2 inch when tested with a 12-foot straightedge, the irregular surface shall be loosened and then refilled with the same kind of material as that used in constructing the course and again rolled as required above.

Along places inaccessible to rollers, the subbase material shall be tamped thoroughly with mechanical or hand tampers.

Watering during rolling, if necessary, shall be in the amount and by equipment approved by the Engineer. Water shall not be added in such a manner or quantity that free water will reach the underlying layer and cause it to become soft.

154-3.6 SURFACE TEST. After the course is completely compacted, the surface shall be tested for smoothness and accuracy of grade and crown; any portion found to lack the required smoothness or to fail in accuracy of grade or crown shall be scarified, reshaped, recompacted, and otherwise manipulated as the Engineer may direct until the required smoothness and accuracy is obtained. The finished surface shall not vary more than 1/2 inch when tested with a 12-foot straightedge applied parallel with, and at right angles to, the centerline.

154-3.7 PROTECTION. Work on subbase course shall not be conducted during freezing temperature nor when the subgrade is wet. When the subbase material contains frozen material or when the underlying course is frozen, the construction shall be stopped.

154-3.8 MAINTENANCE. Following the final shaping of the material, the subbase shall be maintained throughout its entire length by the use of standard motor graders and rollers until, in the judgment of the Engineer, the subbase meets all requirements and is acceptable for the construction of the next course.

METHOD OF MEASUREMENT

154-4.1 Subbase Course will be weighed by the ton or measured by the cubic yard in final position according to Subsection GCP-90-02.

Subbase materials will not be included in any other excavation quantities.

BASIS OF PAYMENT

154-5.1 Subbase Course will be paid for at the contract price, per unit of measurement, accepted in place.

Hauling and placing of these materials is subsidiary.

Payment will be made under:

Item P-154a	Subbase Course - per cubic yard
Item P-154b	Subbase Course - per ton

TESTING REQUIREMENTS

~~AASHTO T 96~~	~~Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine~~
ATM 212	Standard Density of Coarse Granular Materials using the Vibratory Compactor
~~ATM 313~~	~~Degradation Value of Aggregate~~
WAQTC FOP for AASHTO T 27/T 11	Sieve Analysis of Aggregates & Soils
WAQTC FOP for AASHTO T 89	Liquid Limit of Soils
WAQTC FOP for AASHTO T 90	Plastic Limit and Plasticity Index of Soils
WAQTC FOP for AASHTO T 99/T 180	Moisture-Density Relations of Soils
WAQTC FOP for AASHTO T 310	In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods

ITEM P-157 EROSION, SEDIMENT, AND POLLUTION CONTROL

157-1.1 DESCRIPTION. As approved by the Engineer, provide project administration and construction activities to control erosion, sedimentation, and pollution from the Project, according to this section and applicable local, state, and federal requirements, including the Construction General Permit. ~~This work consists of planning, providing, inspecting and maintaining control of erosion, sedimentation, water pollution and hazardous materials contamination.~~

157-1.2 DEFINITIONS. These definitions apply only to Section P-157.

Alaska Certified Erosion and Sediment Control Lead (AK-CESCL). Certification documenting the person has completed training, testing, and other requirements recognized by the Department to satisfy the APDES Construction General Permit requirement for "qualified personnel." AK-CESCL certificates issued in conformance with, and under the authority of the AK-CESCL Memorandum of Understanding are recognized by the Department as meeting this standard. An AK-CESCL certification must be recertified every three years. CPESC, Certified Professional in Erosion and Sediment Control: CISEC, Certified Inspector in Sediment and Erosion Control; and CESCL, Washington Department of Ecology Certified Erosion and Sediment Control Lead are the only other certifications allowed as substitute for the AK-CESCL certification.

Alaska Department of Environmental Conservation (ADEC). The state department that has been authorized to administer the Clean Water Act's National Pollutant Discharge Elimination System in a phased process.

Alaska Pollutant Discharge Elimination System (APDES). The Alaska Pollutant Discharge Elimination System, administered by ADEC.

Area of Land Disturbance. The area of land (soil) that will be disturbed by Construction Activity. Area of Land disturbance does not include pavement removal or pavement milling if the activity does not remove the aggregate underlying the pavement.

~~**BMP (Best Management Practices).** A wide range of project management practices, schedules, activities, or prohibition of practices, that when used alone or in combination, prevent or reduce erosion, sedimentation, and/or pollution of adjacent water bodies and wetlands. BMPs include temporary or permanent structural and non-structural devices and practices. The Department describes common BMPs in its Alaska Storm Water Pollution Prevention Plan Guide.~~

Best Management Practices (BMPs). Temporary or permanent structural and non structural devices, schedules of activities, prohibition of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include, but are not limited to, treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal.

Certified Erosion and Sediment Control Lead (CESCL). Issued by the Washington Department of Ecology.

Certified Inspector of Sediment and Erosion Control (CISEC).

Certified Professional in Erosion and Sediment Control (CPESC). A recognized specialist in soil erosion and sediment control. A CPESC has educational training, demonstrated expertise, experience in controlling erosion and sedimentation, and meets certification standards.

Clean Water Act (CWA). United States Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.)

Construction Activity. Physical activity by the Contractor or any Subcontractor or Utility Company that may result in land disturbance. Construction Activity includes, but is not limited to, clearing, grubbing, excavating, constructing embankment, grading, stockpiling erodible material, processing material, and installation or maintenance of BMP's.

Construction General Permit (CGP). The Alaska Pollutant Discharge Elimination System General Permit for Discharges from Large and Small Construction Activities.

Department Furnished Disposal Site. Areas designated in the Contract for disposal of unsuitable materials.

Department Furnished Haul Route. Areas designated in the Contract for construction, reconstruction, or rehabilitation of the roadway, or areas designated, in the Contract, for temporary use as transport route for material or equipment related to the Project.

Department Furnished Materials Site. A material site identified in the Contract as a "Mandatory Source," or excavated portions within the Project limits where useable material is excavated for use as fill, embankment, or cover in other areas of the Project. A material site identified in the Contract as "Designated Source" is considered a Department Furnished Materials Site if the Contract defines the Department as co-operator for the site. Material sites identified in the Contract as "Available Sources" are not considered Department Furnished for the purpose of defining who has operational control.

Department Furnished Staging and Equipment Areas. Areas designated in the Contract for storage or staging of material or equipment related to the Project.

Electronic Notice of Intent (eNOI). The Electronic Notice of Intent submitted to ADEC, to begin Construction Activity under the CGP.

Electronic Notice of Termination (eNOT). The Electronic Notice of Termination submitted to ADEC, to end coverage under the CGP.

Environmental Protection Agency (EPA). The United States Environmental Protection Agency.

Erosion and Sediment Control Plan (ESCP) A project-specific document prepared by the Department to identify specific information about the Project. The ESCP may include measures to minimize erosion and contain sediment within the Project site. The ESCP provides information for the Contractor's use in developing the Project SWPPP.

~~**ESCP (Erosion and Sediment Control Plan).** The general plan for control of project-related erosion and sedimentation. The ESCP normally consists of a general narrative and a map or site plan. It is developed by the Department and included in the project plans and specifications. It serves as a resource for bid estimation and a framework from which the Contractor develops the project SWPPP.~~

Final Stabilization. Soil disturbing activities at the site have been completed and one of the following methods, as identified in the contract, has been completed:

- establish a uniform and evenly distributed perennial vegetative cover with a density of 70 percent of the native background vegetative cover, or
- construct non-erodible permanent stabilization measures (such as riprap, gabions, geotextiles, pavement, or crushed aggregate base course) where vegetative cover is not required.

~~A point in time when all ground-disturbing activities are complete and permanent erosion and sediment controls are established and functional. The stabilized site is protected from erosive forces of raindrop impact and water flow. Typically, all unpaved areas except graveled shoulders, crushed aggregate base course, or other areas not covered by permanent structures are protected by either a uniform blanket of~~

~~perennial vegetation (at least 70 percent cover density) or equivalent permanent stabilization measures such as riprap, gabions, or geotextiles.~~

Haul Route. Existing or newly constructed road where construction materials are transported and where deposition of sediments or erodible materials may result from the material hauling activity or from the Contractors activity to construct or maintain the road.

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 not limited to, petroleum products related to construction activities and equipment. The HMCP is included as an appendix to the SWPPP.

~~**HMCP (Hazardous Material Control Plan).** The Contractor's detailed plan for prevention of pollution that stems from the use, containment, cleanup, and disposal of hazardous material, including petroleum products generated by construction activities and equipment.~~

Joint Inspection. SWPPP inspection performed together as a collaborative effort of the Contractor and the Department. Contractor's staff performing the inspection must be the Superintendent, SWPPP Manager, or SWPPP Manager's Representative. The Department's staff performing the inspection will be the Engineer or Engineer's qualified representative.

Multi-Sector General Permit (MSGP). The Alaska Pollutant Discharge Elimination System General Permit for Storm Water Discharges associated with Industrial Activity.

~~**NOI.** Notice of Intent to commence ground-disturbing activities under the NPDES General Permit. Use EPA Form 3510-9.~~

~~**NOT.** Notice of Termination of coverage under the NPDES General Permit. Use EPA Form 3510-13.~~

~~**NPDES General Permit.** The Storm Water General Permit for Large and Small Construction Activities, issued by the Environmental Protection Agency (EPA) under the National Pollutant Discharge Elimination System (NPDES). It requires an approved SWPPP and NOIs listed as active status by the EPA prior to ground-disturbing activities for the project.~~

Operator. The party associated with a regulated activity that has responsibility to obtain storm water permit coverage. Operator is defined separately in the storm water general permits (construction and industrial general permits).

~~**PCC Plan (Spill Prevention, Control and Countermeasure).** The Contractor's detailed plan for oil spill prevention and control measures, that meets the requirements of 40 CFR 112.~~

Pollutant. Any substance or item meeting the definition of pollutant contained in 40 CFR 122.2

Project Area. The physical limits of the construction site, Department furnished project staging and equipment areas, Department furnished haul routes where deposition of sediments or erodible materials may result from material hauling activities and Department furnished material and disposal sites directly related to the Contract. The project area also includes all areas of utility relocation and installation, including adjacent utility easements and tie-ins that may extend beyond the defined project limits. Contractor or Commercial Operator furnished material sites, material processing sites, disposal sites, haul routes, staging and equipment storage areas are not included in the Project Area.

Regional Storm Water Specialist. Department employee or representative who provides compliance assistance related to the CGP within a specified region.

Spill Prevention, Control, and Countermeasure Plan (SPCC). The Contractor's detailed plan for petroleum spill prevention and control measures that meets 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, and for the Contractor's compliance with 40 CFR 112, and other applicable federal, state, and local laws and regulations related to hazardous materials.

Stormwater Discharges From Municipal Separate Storm Sewer Systems (MS4s). A conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains that discharges into waters of the United States and is owned or operated by a public agency.

Storm Water Inspector. Department employee or representative who conducts CGP inspections.

Storm Water Pollution Prevention Plan (SWPPP). The Contractor's detailed project specific plan to minimize erosion and contain sediment within the Project site, and to prevent discharge of pollutants that exceed applicable water quality standards. The SWPPP includes, but may not be limited to, amendments, records of activities, inspection schedules, and reports, qualifications of key personnel, and all other documentation required by the CGP and this specification.

Subcontractor Spill Response Coordinator. The Subcontractor's representative with authority and responsibility for coordinating the Subcontractor's activities in compliance with HMCP and SPCC.

Subcontractor SWPPP Coordinator. The Subcontractor's representative with authority to direct the Subcontractor's work; and who is responsible for coordination with the SWPPP Manager and for the Subcontractor's compliance with the SWPPP.

Superintendent. The Contractor's authorized representative in responsible charge of the work, who is duly authorized by the Contractor, in accordance with CGP, Appendix F, Part 1.12. The Superintendent has responsibility and authority for the overall operation of the Project and for Contractor furnished sites and facilities directly related to the Project.

SWPPP Amendment. A revision or document that adds to, deletes from, or modifies the SWPPP.

SWPPP Manager. The Contractor's qualified representative responsible for CGP compliance, implementing the SWPPP, conducting inspections, updating the SWPPP, supervising Section P-157 work, monitoring construction activities, and with authority to suspend work and implement corrective actions.

SWPPP Manager's Representative. The Contractor's qualified representative who may be assigned certain SWPPP Manager's tasks and authorities.

SWPPP Preparer. The Contractor's qualified representative who is responsible for developing the initial SWPPP.

SWPPP Template. EPA's template for the Contractor's use in developing the SWPPP. The template is available online at EPA's website. Select "SWPPP Template – Authorized States."

~~**SWPPP (Storm Water Pollution Prevention Plan).** The Contractor's plan for erosion and sediment control and storm water management under the NPDES General Permit. The SWPPP is developed by the Contractor and describes site-specific controls and management of issues identified for the project. The approved SWPPP replaces the ESCP.~~

Temporary Stabilization. The protection of exposed soils (disturbed land) from wind and water erosion during the construction process, until final stabilization is established.

Utility Company. A Utility Company or their contractor performing work concurrently with the construction of this project as outlined in subsection 50-06.

Utility Spill Response Coordinator. The Utility's representative with authority and responsibility for coordinating the utility's activities in compliance with HMCP and SPCC.

Utility SWPPP Coordinator. The Utility's representative with authority to direct the Utility's work; and who is responsible for coordination with the SWPPP Manager and for the Utility's compliance with the SWPPP.

157-1.3 PLAN AND PERMIT SUBMITTALS. Contractor submission and Department review deadlines in this section supersede subsection 60-08 and 80-03.

~~For all projects that disturb one acre or more of ground submit three copies each of your SWPPP and HMCP to the Engineer for approval. Submit one copy of your SPCC Plan (if required under Subsection 157-2.3) to the Engineer. Sign all submittals. Deliver these documents to the Engineer no less than five calendar days prior to the preconstruction conference.~~

~~The Department will review the SWPPP and HMCP submittals within 14 calendar days. Submittals will be returned to you as either requiring modification, or as approved by the Department. The approved SWPPP must contain a certification, and be signed by you according to the Standard Permit Conditions of the NPDES General Permit, Part 8, Appendix G. You must receive an approved SWPPP before you submit your NOI.~~

~~For projects that disturb five acres or more of ground, submit a copy of your approved and signed SWPPP, with the required permit fee to the Alaska Department of Environmental Conservation (ADEC) Storm Water Coordinator. Transmit proof of this submission to the Engineer.~~

~~Submit your signed NOI to EPA (electronic submission may be available). Submit copies of your signed NOI to the Engineer and to ADEC. Transmit proof of your ADEC submission to the Engineer. The Department will transmit the Department's NOI to the EPA. Allow adequate time for state and federal processing, prior to commencing ground-disturbing activities.~~

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

~~When the Project is stabilized, as determined by the Engineer, submit your signed NOT to EPA with a copy to the Engineer. The Department will transmit the Department's NOT to the EPA.~~

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.

a. **SWPPP.** Submit three signed copies of the SWPPP to the Engineer for approval. Deliver these documents to the Engineer at least 21 calendar days before you plan to begin Construction Activity. Organize and bind the SWPPP and related documents for submittal according to the requirements of P-157-2.1, paragraph 2.

   The Department will review the SWPPP submittals within 14 calendar days after they are received. Submittals will be returned to the Contractor, and marked as either requiring modification or as approved by the Department.

b. **HMCP.** Submit three copies of the HMCP as an appendix to the SWPPP, and in accordance with the requirements for submitting the SWPPP.

c. **SPCC.** When SPCC is required under subsection P-157-2.3, submit three signed copies of the SPCC to the Engineer. Deliver these documents to the Engineer at least 21 calendar days before you plan to begin construction activity.

The Department will keep the SPCC as a record document, and reserves the right to review it and require modifications.

d. **eNOI.** Obtain APDES construction authorization for the Project under the CGP. APDES authorization and compliance for Contractor furnished and commercial operator furnished areas are the sole responsibility of the Operators.

The Contractor and the Engineer must sign and certify the approved SWPPP in accordance with CGP, Appendix F, before the Contractor submits their eNOI for the Project to ADEC. The certification statement cannot be amended or edited.

Submit an eNOI for the Project to ADEC with the required fee. Submit three copies of the eNOI to the Engineer when the eNOI is submitted to ADEC. The Department will submit the Department's eNOI to the ADEC and provide a copy to the Contractor for inclusion in the SWPPP. Allow adequate time for state processing of the eNOI, and for the ADEC to list the eNOIs as active status, before beginning Construction Activity.

e. **eNOT.** Within 30 days after the Engineer has determined you may end SWPPP activities for the Project, submit your eNOT for the Project to ADEC, and send a copy of the eNOT to the Engineer. Within 30 days of the Engineer's determination, the Department will submit the Department's eNOT to the ADEC, and will terminate the Department's CGP coverage for the Project and send a copy to the Contractor.

f. **ADEC SWPPP Review.** When the CGP, Part 10 F requires ADEC SWPPP review; transmit a copy of the Department approved SWPPP with the required fee to ADEC using delivery receipt confirmation. Transmit a copy of the delivery receipt confirmation to the Engineer within seven (7) calendar days of receiving the confirmation. Transmit a copy of the ADEC SWPPP review letter to the Engineer within seven (7) calendar days of receipt from ADEC. Amend the SWPPP as necessary to address ADEC comments and transmit a copy of the SWPPP Amendments to the Engineer within seven (7) calendar days of receipt of ADEC review comments. Include a copy of the ADEC SWPPP review letter in the SWPPP.

g. **Local Government SWPPP Review.** When the CGP, Part 10 F requires local government review, transmit a copy of the Department-approved SWPPP with the required fee using delivery receipt confirmation. Transmit a copy of the delivery receipt confirmation to the Engineer within seven (7) calendar days of receiving the confirmation. Transmit a copy of any comments by the local government to the Engineer within seven (7) days of receipt. Amend the SWPPP as necessary to address local government comments and transmit SWPPP Amendments to the Engineer within seven (7) days of receipt of the comments.

157-1.4 PERSONNEL QUALIFICATIONS. Include qualifications of the Superintendent, SWPPP Preparer, SWPPP Manager, and SWPPP Manager's Representatives in the SWPPP.

The SWPPP Preparer must meet at least one of the following qualifications:

- current certification as a CPESC
- current certification as AK-CESCL, and at least three years experience in erosion and sediment control (provide documentation including project names, project timelines, and work responsibilities demonstrating the experience requirement)
- Professional Engineer registered in the State of Alaska and current certification as AK-CESCL

Include the SWPPP Preparer's qualification in the SWPPP.

The Superintendent and any designated Relief Superintendent must meet all the following qualifications:

- current certification as AK-CESCL
- duly authorized representative, as defined in the CGP, Appendix F

The SWPPP Manager and SWPPP Manager's Representative must hold current AK-CESCL certification.

157-1.5 SIGNATURE/CERTIFICATION REQUIREMENTS AND DELEGATIONS.

a. eNOI and eNOT. The eNOI and eNOT must be signed and certified by a responsible corporate officer, in accordance with CGP Appendix F, Section 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. Delegate signature and certification authority to the Superintendent, in accordance with CGP Appendix F, Section 1.12, for the SWPPP. SWPPP inspections, and other reports required by the CGP. Use form 25D-108. The form and certification must be used verbatim and must not be altered other than to insert names, dates, and signatures as included on the form. Include a copy of the written delegation form 25D-108, and the Department's delegation form 25D-107 in the SWPPP. Delegation is not required if the Superintendent is a responsible corporate officer for the Contractor, as defined in CGP Appendix F, Section 1.12.

157-1.6 OPERATORS.

a. The Department and the Contractor are both Operators for the Project and for Department furnished:

- material sites
- disposal sites
- haul routes where deposition of erodible materials may result from material hauling activity
- staging areas
- equipment storage areas
- utility relocation and installation activities associated with the project

b. The Department is not an operator for Contractor furnished:

- material sites
- material processing sites
- disposal sites
- haul routes where deposition of erodible materials may result from material hauling activity
- staging areas
- equipment storage areas

The Contractor is an operator for the above listed Contractor furnished areas. Compliance with APDES and other applicable federal, state, and local requirements, and securing all necessary clearances, rights, and permits for these Contractor furnished areas are the sole responsibility of the Contractor. Document the name of each operator, and the locations of these areas in the Project SWPPP. The control measures for these sites may be included in the Project SWPPP if they are eligible for CGP coverage. If this is the case, then the Contractor's and the Department's eNOI acreage will be different. If the area must be covered by the industrial storm water permit, note that there is a 30-day waiting period for the eNOI to become active.

c. The Department is not an operator for commercial and utility operator furnished:

- material sites
- material processing sites

- disposal sites
- haul routes
- staging areas
- equipment storage areas

The commercial operator is an operator for the above-listed commercially operator-furnished sites. Compliance with APDES and other applicable federal, state, and local requirements, and securing all necessary clearances, rights, and permits for these commercial operator furnished areas are the sole responsibility of the commercial operator. Document the name of each operator, and the locations of these areas in the Project SWPPP.

d. A Utility company is not an Operator when utility relocation is performed concurrently with the Project. The Department maintains operational control over the plans and specifications, and the Contractor has day-to-day control over the various utility construction activities that occur in support of the Project. A Utility company is considered a subcontractor for concurrent relocation.

The Department and a Utility company are both Operators for the Project when utility relocation is performed in advance of Project construction. After the Highway Contractor has an active NOI for the Project, the Utility company no longer has Operator status and files a NOT for the SWPPP covering only the utility work. Remaining relocation is identified in and performed under the Project SWPPP.

157-2.1 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS.

Use a SWPPP preparer to develop the SWPPP and associated documents, in accordance with the requirements of the CGP. The SWPPP Preparer must put their name, title and company name and qualifications in the SWPPP.

Use the Department's ESCP as a starting point for developing the SWPPP. Develop the SWPPP in accordance with EPA's SWPPP template for Authorized States, with the following exceptions:

- In Section 3 (Good Housekeeping), add a subsection to describe dedicated asphalt plants and/or dedicated concrete plants, give their locations, and identify the controls that will be used to minimize pollutants from them. If there are no dedicated asphalt or concrete plants, then state that in the SWPPP.
- Appendix H is not required
- Add appendices for:
    - Endangered Species Act and historic preservation documents
    - Other Permits (404, Section 10, etc.)
    - Hazardous Material Control Plan
    - Subcontractor and Utility Certifications
    - BMP descriptions
    - Rainfall logs
    - NOT form
    - Personnel qualification & training certifications for:
        - Superintendent
        - SWPPP Preparer
        - SWPPP Manager
        - SWPPP Manager's Representative
        - Department's SWPPP Inspector
- Add forms completed by the Department:
    - SWPPP Delegation of Signature Authority (25D-107)
    - DOT&PF SWPPP Certification (25D-109)

- Use Department forms for:

  - Construction Site Inspection Report (25D-100 parts 1&2)
  - SWPPP Subcontractor Certification (25D-105)
  - SWPPP Pre-Construction Site Visit (25D-106)
  - SWPPP Delegation of Signature Authority for CGP Documents (25D-108 Contractor, 25D-107 DOT&PF)
  - SWPPP Grading and Stabilization Activities Log (25D-110)
  - Contractor's SWPPP Certification (25D-111)
  - SWPPP Corrective Action Log (25D-112)
  - SWPPP Delayed Action Item Report (25D-113)
  - SWPPP Amendment Log (25D-114)
  - SWPPP Daily Record of Rainfall (25D-115)
  - SWPPP Training Log (25D-125)
  - Utility Certification Form

BMP descriptions and/or schematics in the SWPPP or SWPPP amendment must provide a citation for the BMP Manual or publication that was used as a source. The description must include either or both schematics and text descriptions, the full title of the reference, author, publisher, and date of publication. If a BMP was created for a project specific situation and no published source was used, then the SWPPP or SWPPP amendment must state that no manual or publication was used as a source; and a description, design schematic and placement of the BMP must be described.

Compile the SWPPP in three ring binders with tabbed and labeled dividers for each section and appendix included in EPA's template for Authorized States. Incorporate and cite applicable requirements of the project permits and environmental commitments into the SWPPP. Incorporate SWPPP activities into the Project CPM Schedule.

Use the Department's documentation of consultation with the State Historic Preservation Officer and federal agencies for consideration of historic properties and endangered species. Make additional consultations as necessary for Contractor or commercial operators' specific activities which fall outside the Project limits, or which may result in changes to the Project footprint or timeline. You may cover these activities within the project SWPPP provided they are eligible for coverage under the CGP, and provided the SWPPP clearly and specifically identifies the Operators, their activities, and the portions of the SWPPP and project areas for which they are responsible.

The SWPPP Preparer must visit the project site before construction activity begins. Document the site visit on Form 25D-106, SWPPP Pre-Construction Site Visit. The SWPPP Preparer must visit the site accompanied by the Contractor, if the SWPPP Preparer is not a Contractor employee. Give the Department at least seven days notice of the site visit, so that the Department may participate. The pre-construction inspection must:

- Identify or verify the SWPPP's stated opportunities to phase construction activities.
- Identify or verify the SWPPP's description of appropriate BMPs and their sequencing.
- Identify or verify the SWPPP's list of sediment controls that must be installed prior to beginning Construction Activities.
- Be documented in the SWPPP on Form 25D-106, SWPPP Pre-Construction Site Visit, including the names of attendees and the date.

The findings of the visit must be incorporated in the development of the SWPPP, or by amendment if the SWPPP was submitted prior to the visit.

The SWPPP must identify specific areas where potential erosion, sedimentation, or pollution may occur. The potential for wind erosion must be addressed. The potential for erosion at drainage structures must be addressed. Describe site specific BMPs, source controls, sediment controls, discharge points, and a plan

including schedule and implementation procedures for temporary and final stabilization. Describe all temporary and permanent stabilization measures. Include typical installation drawings for all BMPs that will be incorporated in the Project. Include the Contractor's schedule and the schedule for stabilization and installation of other BMPs.

The SWPPP must provide erosion and sediment control measures for all land disturbances resulting from the Contractor, Utility Companies and all Subcontractors activities during the course of the contract. The SWPPP must consider the activities of utility companies performing work on the Project. The SWPPP must describe the roles and responsibilities of the Contractor, Utility Companies, subcontractors, and the Department with regard to implementation of the SWPPP. The SWPPP must identify all operators for the Project and identify the areas over which each operator has operational control.

Specify the line of authority and designate a Superintendent, SWPPP Manager, and each SWPPP Manager's Representative. Provide 24 hour contact information for the Superintendent, SWPPP Manager, and for each SWPPP Manager's Representative. The Superintendent, SWPPP Manager, and each SWPPP Manager's Representative must have 24 hour contact information for all Subcontractor SWPPP Coordinators.

Identify the SWPPP inspection schedule in the SWPPP.

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 documents necessary to satisfy the requirements of the CGP and this specification.

~~For projects that disturb 1 acre or more of ground, you must prepare a Storm Water Pollution Prevention Plan. Use the Department's ESCP to develop a SWPPP based on your scheduling, equipment, and use of alternative BMPs. The plan must consider first preventing erosion, then minimizing erosion, and finally trapping sediment before it enters waterways.~~

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

~~Specify the line of authority and designate your field representative for implementing SWPPP compliance. Designate one representative for each subcontractor who perform earth disturbing activities or who install and maintain erosion and sediment control measures.~~

157-2.2 HAZARDOUS MATERIAL CONTROL PLAN (HMCP) REQUIREMENTS. Prepare the HMCP for prevention of pollution from storage, use, containment, cleanup, and disposal of all hazardous material, including petroleum products related to construction activities and equipment (See 40 CFR 117 and 302 for listing of hazardous materials).

Compile Material Safety Data Sheets in one location and reference that location in the HMCP.

List and give the location and estimated quantities of hazardous materials to be used or stored on the Project. Store hazardous materials in covered storage areas. Include secondary containment for all hazardous material storage areas.

List the types and approximate quantities of response equipment and cleanup materials available on the Project. Include a list and location map of cleanup materials, at each different work site and readily available off site (materials sources, material processing sites, disposal sites, staging areas, etc).

Designate a Spill Response Field Representative and identify the line of authority. Designate a Subcontractor Spill Response Coordinator for each subcontractor. Provide 24 hour contact information for

the Contractor's Spill Response Field Representative. The Contractor's Spill Response Field Representative must have 24 hour contact information for each Subcontractor Spill Response Coordinator.

Identify the locations where storage, fueling and maintenance activities will take place, describe the maintenance activities, and list controls to prevent the accidental spillage of oil, petroleum products, and other hazardous materials.

Detail procedures for containment and cleanup of hazardous substances. Detail a plan for the prevention, containment, cleanup, and disposal of soil and water contaminated by spills. Detail a plan for dealing with contaminated soil and water encountered during construction.

Detail methods of disposing of waste petroleum products and other hazardous materials generated by the Project. Identify haul methods and final disposal areas. Assure final disposal areas are permitted for hazardous material disposal.

Store spill response materials, appropriate to the hazards associated with that site, in sufficient quantity at each identified location.

Include the HMCP as an appendix to the SWPPP.

~~Prepare a HMCP for the handling, storage, cleanup, and disposal of petroleum products and other hazardous substances. (See 40 CFR 117 and 302 for listing of hazardous materials.)~~

~~List and give the location of all hazardous materials, including office materials, to be used and/or stored on site, and their estimated quantities. Detail your plan for storing these materials as well as disposing of waste petroleum products and other hazardous materials generated by the project.~~

~~Identify the locations where storage, fueling and maintenance activities will take place, describe the maintenance activities, and list all controls to prevent the accidental spillage of oil, petroleum products and other hazardous materials.~~

~~Detail your procedures for containment and cleanup of hazardous substances, including a list of the types and quantities of equipment and materials available on site to be used.~~

~~Detail your plan for the prevention, containment, cleanup, and disposal of soil and water contaminated by accidental spills. Detail your plan for dealing with unexpected contaminated soil and water encountered during construction.~~

~~Specify the line of authority and designate your field representative for spill response and one representative for each subcontractor.~~

157-2.3 SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN (SPCC) REQUIREMENTS. Prepare and implement an SPCC when required by 40 CFR 112; when both of the following conditions are present on the Project:

- oil or petroleum products from a spill may reach navigable waters, and
- 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 in the SWPPP.

~~**SPILL PREVENTION, CONTROL AND COUNTERMEASURE (SPCC) PLAN REQUIREMENTS.** Prepare and implement a SPCC Plan that is certified by a licensed Professional Engineer, when required by 40 CFR 112, including:~~

~~**a.** When oil spills may reach navigable waters; and~~
~~**b.** Your total above ground oil storage capacity is greater than 1,320 gallons.~~

~~Comply with 40 CFR 112 and address the following issues in your SPCC Plan:~~

~~**a.** Operating procedures that prevent oil spills;~~
~~**b.** Control measures installed to prevent a spill from reaching navigable waters; and~~
~~**c.** Countermeasures to contain, clean up, and mitigate the effects of an oil spill.~~

157-2.4 RESPONSIBILITY AND AUTHORITY OF THE SUPERINTENDENT, SWPPP MANAGER, AND SWPPP MANAGER'S REPRESENTATIVE. The Superintendent is responsible for the overall operation of the Project and all Contractor furnished sites and facilities directly related to the Project. The Superintendent shall sign and certify the SWPPP, SWPPP inspections, and other reports required by the CGP, except the NOI and NOT. The Superintendent may not delegate the task or responsibility of signing and certifying the SWPPP, SWPPP inspections, and other reports required by the CGP. If the superintendent is unavailable, a relief superintendent may sign and certify reports required by the CGP. If a relief Superintendent is used, document the personnel change, including a photo copy of their AK-CESCL certification, and include their beginning and ending dates in the SWPPP.

The Superintendent may assign certain duties to the SWPPP Manager. Those duties may include:

a. Ensuring Contractor's compliance with the SWPPP and CGP,
b. Ensuring construction activity does not result in discharge of pollutants that exceed applicable water quality standards,
c. Performing SWPPP inspections,
d. Updating the SWPPP with amendments and forms, and
e. Directing and overseeing installation, maintenance, and removal of BMPs

The SWPPP Manager may assign their duties to a SWPPP Manager's Representative.
The Superintendent, SWPPP Manager, and the SWPPP Manager's Representative shall be knowledgeable in the requirements of this section, the SWPPP, CGP, BMPs, HMCP, SPCC, environmental permits, and environmental commitments.

The Superintendent, SWPPP Manager, and the SWPPP Manager's Representative shall have the Contractor's complete authority to suspend construction activities that do not conform to the SWPPP or CGP.

157-2.5 MATERIALS. Comply with the material requirements described in the Plans and Specifications.

Use materials suitable to withstand hydraulic, wind, and soil forces, and to control erosion and trap sediments in accordance with the requirements of the CGP.

Straw that is certified as free of noxious weed by the United States Department of Agriculture, Natural Resources Conservation Service, Local Soil and Water Conservative District, Alaska Weed Free Forage Certification Program must be used when available. Hay may not be substituted for straw.

Silt fences Section P-680, Geotextile for Silt Fence.

Temporary Seed Section T-901

Erosion, Sediment, and Pollution Control - Materials

Fiber Roll: (commonly called straw wattle)

a. Comprised of UV-degradable plastic netting or 100 percent biodegradable material.
b. Filled with straw, flax, rice, coconut fiber material or composted material.
c. Staking shall be made of 100 percent biodegradable materials.

Provide the Engineer certification stating the name of the manufacturer, product name, style number, chemical composition of the fiber, netting and certification of the weed-free status from the manufacturer. Furnish a sample to the Engineer seven days before the scheduled installation.

Manufactured Inlet Protection System:

a. Manufacturers:
   Ultra Tech International – Ultra-DrainGuard
   Bowhead Environmental and Safety - StreamGuard Exert II Sediment Insert
   Enpac - Catch Basin Insert, Oil and Sediment or
b. Approved equal.

Sand Bag Inlet Sediment Trap:

a. Sandbag sack fabric shall be a nonwoven, needle punched design meeting the following requirements:

Grab Tensile Strength	ASTM D 4632200 pounds (min.)
Grab Elongation	ASTM D 463215 – 70%
Mullen Burst Strength	ASTM D 3786400 psi. (min.)
Trapezoidal Tear Strength	ASTM D 453395 lbs. (min.)
Apparent Opening Size	ASTM D 4751No. 30 U.S. STD sieve (max)
Permittivity	ASTM D 44910.01 sec-1 (min.)
Ultraviolet Light Stability, Retained Strength	ASTM D 435590%
Puncture Strength	ASTM D 4833120 lbs. (min.)

These requirements are for Minimum Average Roll Values (MARV) verified in accordance with ASTM D 4759.

b. Seam Thread:
Similar durability to the sandbag sack fabric.
c. Sandbag Fill Material:
Use granular soils for filling the sacks that meets the requirements of base course material as specified in item P-209 or surface course material as specified in item P-208.
d. Cinch Ties: Plastic ties or equivalent tie recommended by the sandbag manufacturer.

157-3.1 CONSTRUCTION REQUIREMENTS. Comply with the SWPPP and the requirements of the CGP.

Ensure all subcontractors and utility companies understand and comply with the SWPPP and the CGP. Provide SWPPP information to utility companies. Notify the Engineer immediately if the actions of any utility company or subcontractor do not comply with the SWPPP and the CGP. Provide training to subcontractors & utility companies on control measures at the site and applicable storm water pollution prevention procedures and document the dates and attendees to these trainings in Appendix J of the SWPPP.

a. Starting Construction:

Do not begin Construction Activity until:

- the SWPPP has been approved by the Engineer
- authorized by the Engineer
- the Project eNOI for the Department and for the Contractor are both listed as Active Status on the ADEC website

- the SWPPP preparer has visited the Project and the SWPPP has been developed (or amended) with findings from the visit. Also document in the SWPPP the date of the visit and the persons conducting the visit.

Post notices on the outside wall of the Contractor's project office, and at publicly accessible locations near the beginning and end of the Project. Protect postings from the weather and locate so the public can read them without obstructing construction activities (for example, at an existing pullout). Include the following information in each of the posted notices:

- Copy of all eNOIs related to this project
- Name and phone number of SWPPP Manager
- Location of the SWPPP available for public viewing.

Install an outdoor rain gauge in an approved and readily accessible location on the Project.

b. During Construction:

Comply with requirements of the HMCP and SPCC, and all state and federal regulations that pertain to the handling, storage, cleanup, and disposal of petroleum products or other hazardous substances. Contain, clean up, and dispose of discharges of petroleum products and other hazardous materials. Place absorbent pads or other suitable containment under fill ports while fueling and under equipment during maintenance or repairs. Install secondary containment under all stationary equipment that contains petroleum products.

Comply with the requirements of 18 AAC 75 and AS 46, Oil and Hazardous Substances Pollution Control. Report petroleum product spills as required by federal, state, and local law, and as described in the HMCP and SPCC.

Comply with the requirements of the SWPPP. Implement temporary and permanent erosion and sediment control measures identified in the SWPPP and as directed by the Engineer. Keep the SWPPP current. If storm water discharges threaten water quality, take immediate action. Comply with the requirements of 18 AAC 70 State of Alaska Water Quality Standards, AS 16.05.841 and 16.05.871 Protection of Fish and Game, 11 AAC 112 Alaska Coastal Management Program, Section 404 of the CWA, and all other applicable federal, state, and local statutes and regulations.

Coordinate with subcontractors and utility companies doing work in the project area so BMPs and temporary and permanent stabilization are installed, maintained, and protected from damage.

If you suspect or have determined that there has been an incident of CGP non-compliance that may endanger health or the environment, then immediately report it to the Engineer. The Engineer will determine whether the incident is required to be reported to the EPA and ADEC as described in the CGP. If the incident is reported to the EPA and ADEC, the Department will submit oral and written reports on behalf of the Department and the Contractor. Be prompt with your notice to the Engineer because the oral report to EPA and ADEC is required within 24 hours of the time you become aware of the incident. The Superintendent must co-sign with the Department, the written report to EPA and ADEC.

c. Corrective Action and Maintenance of BMPs:

Maintain temporary and permanent erosion and sediment control measures in effective operating condition. Remove sediment and debris from sediment traps, silt fences, and sediment ponds before sediment or debris accumulates to 50% of the BMP's design capacity.

Implement corrective action:

- if an incident of non-compliance with the SWPPP or CGP is identified

- if an inspection identifies the SWPPP or any part of the SWPPP is ineffective in preventing the discharge of pollutants that exceed applicable water quality standards
- if the Engineer determines the SWPPP or any part of the SWPPP is ineffective in preventing the discharge of pollutants that exceed applicable water quality standards
- if any BMP is damaged, undercut, or unable to effectively perform the intended function
- if any BMP is at or exceeding 50% of its design storage capacity
- whenever there is a change in conditions, design, construction, operation, or maintenance that could affect the discharge of pollutants in storm water leaving the Project

Complete corrective action:

- as soon as possible
- before the next storm event whenever practicable
- no later than the end of the day, six calendar days following the day of inspection identifying the need for corrective action

If implementation before the next storm event is impracticable, the situation must be documented in the SWPPP using the "Delayed Action Item Report" and alternative BMPs must be implemented as soon as possible.

d. Stabilization.

Stabilization may be accomplished using temporary or permanent measures. Initiate stabilization of disturbed areas, stockpiles, and of erodible aggregate layers so that all of the following conditions are satisfied:

- as soon as practicable
- as soon as necessary to avoid discharge of pollutants, that exceed applicable water quality standards
- prior to freezing conditions that may limit or eliminate options for temporary stabilization
- prior to seasonal thaw Seasonal thaw is the annual (first) recurrence of snow and ice melting after a prolonged period of freezing conditions.
- as identified in the SWPPP schedule and/or phasing
- in accordance with stabilization schedule requirements of applicable project permits
- no later than 14 days after each cessation of land-disturbing activities

Land may be disturbed multiple times during a project. Coordinate work to minimize area of land disturbance as much as practicable. Do not disturb more area than you can stabilize in the time limits specified, and with the resources available.

Temporary stabilization measures may include individual or a combination of measures including but not limited to vegetative cover, mulch, stabilizing emulsions, blankets, mats, soil binders, non-erodible cover, dust palliatives, or other approved methods.

Prepare the surface to be seeded to reduce erosion potential and to facilitate germination and growth of vegetative cover. Maintain seeded areas. Reseed areas where growth of temporary vegetative cover is inadequate to stabilize disturbed ground.

Apply permanent seed in accordance with Section T-901, at locations where permanent seed is indicated on the plans and land-disturbing activity is permanently ceased.

Before deactivating a stream bypass or stream diversion used for construction of a bridge, culvert, or drainage structure, install stabilization up to ordinary high water:

- at the inlet and outlet of the culvert, drainage structure, or bridge

- in the area upstream and downstream of the culvert, drainage structure, or bridge, that is disturbed during installation or construction of the culvert, drainage structure, or bridge
- under the bridge

Immediately after placing a culvert or drainage structure, install temporary or permanent stabilization when a stream bypass is not used for construction:

- at the culvert or drainage structure inlet and outlet
- in the area upstream and downstream of the culvert or drainage structure, that is disturbed in the process of installing the culvert, culvert end walls, culvert end sections, or drainage structure

e. Ending SWPPP Activities and SWPPP Maintenance.

The Engineer will determine SWPPP activities have ended when all of the following requirements are met:

- Land disturbing activities have ceased
- The Project site (including Department furnished material sources, disposal sites, staging areas, equipment areas, etc.) has achieved final stabilization
- Temporary BMPs have been removed

Submit eNOT in accordance with subsection P-157-1.3e.

If the contractor's eNOI acreage includes areas where the Department is not an operator and co-permittee, then the contractor may not be able to file an eNOT at the same time as the Department. In this case, the Contractor must state in the SWPPP which project areas have reached final stabilization.

The Department will provide a copy of its eNOT to the contractor for inclusion in the SWPPP.

f. Record Transmittal and Retention.

Contractor must provide the Department a copy of all Records as defined herein.

Transmit one electronic copy of the initially approved SWPPP and the final SWPPP, including all amendments and appendixes, to the Engineer when the project eNOTs are filed.

Retain copies of the SWPPP, including documents listed under P-157-3.2 SWPPP DOCUMENTS, for at least three years after the date of eNOT. If EPA or ADEC inspects the project, issues a Notice of Violation (NOV), or begins investigation for a potential NOV before the three year retention period expires, retain the SWPPP and all records related to the SWPPP and CGP until EPA and/or ADEC has determined all issues related to the investigation are settled.

Retain copies of the SWPPP, and records required by the EPA Consent Decree, including documents listed under 157-3.2 SWPPP DOCUMENTS, for at least one year after the termination of the Consent Decree.

~~Do not begin ground-disturbing work until after the EPA has acknowledged receipt of your NOI and the Department's NOI, and has listed them as active status. The EPA will post the status of the NOIs on the EPA website.~~

~~Post at the construction site:~~

~~a. NPDES Permit number, if available, and a copy of the NOI,~~
~~b. Name and phone number of your local contact person, and~~
~~c. Location of a SWPPP available for viewing by the public.~~

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

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

Maintain all temporary and permanent erosion and sediment control measures in effective operating condition.

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

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

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

(1) During construction, inspect the following at least once every seven calendar days and within 24 hours of the end of a storm exceeding 0.5 inch in 24 hrs. (as recorded at or near the project site):

(a) Disturbed areas that have not been finally stabilized.
(b) Areas used for storage of erodible materials that are exposed to precipitation.
(c) Sediment and erosion control measures.
(d) Locations where vehicles enter or exit the site.

(2) Prior to winter shutdown, to ensure that the site has been adequately stabilized.

(3) At project completion, to ensure final stabilization of the project.

b. Winter Inspections. During winter shutdown, conduct inspections at least once every month and within 24 hours of a storm resulting in rainfall of 0.5 inch or greater. Monthly inspection requirements may be waived by the Engineer until one month before thawing conditions are expected to result in a discharge, if all of the following requirements are met:

(1) Below-freezing conditions are anticipated to continue for more than one month.
(2) Land disturbance activities have been suspended.
(3) The beginning and ending dates of the waiver period are documented in the SWPPP.

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

(1) A summary of the scope of the inspection.
(2) Name(s) of personnel making the inspection.
(3) The date of the inspection.
(4) Observations relating to the implementation of the SWPPP.
(5) Any actions taken as the result of the inspection.
(6) Incidents of non-compliance.

Where a report does not identify any incidents of non-compliance, certify that the facility is in compliance with the SWPPP and NPDES General Permit. You and the Engineer will sign the report according to Standard

~~Permit Conditions of the NPDES General Permit, Part 8, Appendix G. All certifications shall be included as an appendix to the SWPPP.~~

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

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

~~Submit amendments to the SWPPP to correct problems identified as a result of any:~~

~~**a.** Storm or other circumstance that threatens water quality, and~~
~~**b.** Inspection that identifies existing or potential problems.~~

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

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

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

~~**a.** When the project site (including all material sources, disposal sites, etc.) has been finally stabilized and all storm water discharges from construction activities authorized by this permit have ceased, or~~

~~**b.** When the construction activity operator (as defined in the NPDES General Permit) has changed.~~

~~If you fail to coordinate temporary or permanent stabilization measures with the earthwork operations in a manner to effectively control erosion and prevent water pollution, the Engineer may suspend your earthwork operations and withhold monies due on current estimates for such earthwork items until all aspects of the work are coordinated in a satisfactory manner.~~

~~If you fail to:~~

~~**a.** Pursue work required by the approved SWPPP,~~
~~**b.** Respond to inspection recommendations and/or deficiencies in the SWPPP, or~~
~~**c.** Implement erosion and sedimentation controls identified by the Engineer,~~

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

157-3.2 SWPPP DOCUMENTS. The SWPPP and related documents maintained by the Contractor are the record documents for demonstrating compliance with the CGP. 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 approved SWPPP, HMCP, and SPCC at the on-site project office. If there isn't an on-site project office, keep the information in an office that is within 30 miles, by road from the Project.

Maintain all SWPPP documents in binders in one common location. Include the following items in the SWPPP binders:

- eNOI (all applicable)
- Acknowledgement letters from EPA or ADEC to each operator filing an eNOI

- SWPPP Subcontractor Certification (25D-105)
- SWPPP Pre-Construction Site Visit (25D-106)
- SWPPP Delegation of Signature Authority for CGP Documents (25D-108 Contractor, 25D-107 DOT&PF)
- Copies of current AK-CESCL card for Superintendent, SWPPP Manager, SWPPP Manager's Representative, and Department's SWPPP Inspector(s)
- Approved SWPPP
- SWPPP Grading and Stabilization Activities Log (25D-110)
- SWPPP Certification (25D-111 Contractor, 25D-109 Department)
- HMCP (with lines of authority and contract information)
- SPCC when required
- SWPPP Preparer's qualifications
- SWPPP Amendments
- SWPPP Amendment Log (25D-114)
- SWPPP Inspection Reports (25D-100 parts 1&2)
- SWPPP Corrective Action Log (25D-112)
- SWPPP Grading and Stabilization Activities Logs (25D-110)
- SWPPP Delayed Action Item Report (25D-113)
- SWPPP Daily Record of Rainfall (25D-115)
- SWPPP Training Log (25D-125)
- Lines of Authority and Contact Information for Superintendent, SWPPP Manager, SWPPP Manager's Representative, and Subcontractor SWPPP Coordinators
- ADEC SWPPP Review Letter (when required and once received)
- eNOT (all applicable)
- Any other records related to the SWPPP, SWPPP compliance, or CGP reporting requirements

157 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. Prepare SWPPP Corrective Action Log, SWPPP Amendment Log, SWPPP Grading and Stabilization Logs, and SWPPP Daily Record of Rainfall forms. Joint SWPPP inspections must be performed by the Superintendent, SWPPP Manager, or the SWPPP Manager's Representative; and by the Engineer or Engineer's qualified representative.

a. Before Construction.

Before beginning Construction Activity, conduct a Joint Inspection of the Project with the SWPPP Preparer. Document the Joint Inspection on form 25D-106. Incorporate the results of the visit into the SWPPP and document, including the date of the visit and personnel attending the visit.

b. During Construction.

Conduct Joint Inspections (see Definitions P-157-1.2) at least once every seven days during construction.

Indicate the inspection schedule in the SWPPP and conduct Joint Inspections in accordance with the above schedule.

If the Engineer approves the Contractor conducting an inspection that is not joint, then the Contractor must provide the Engineer with a copy of the inspection report within three days of the inspection and must document the transmittal as well. In this case, the Contractor must explain why conducting a Joint Inspection was not practical and include the explanation in the SWPPP.

c. Before Seasonal Suspension of Work.

Conduct Joint Inspection before seasonal suspension of work to review condition and applicability of BMPs and SWPPP. Confirm SWPPP, temporary stabilization, and BMPs are installed and functioning in accordance with the requirements of subsection P-157-3.1.

d. During Seasonal Suspension of Work.

Conduct Joint, or as otherwise approved by the Engineer, Inspections in accordance with the inspection schedule indicated in the approved SWPPP. Inspection frequency during seasonal suspension of work may be reduced to at least one inspection every month if approved by the Engineer and the revised inspection frequency is documented as an amendment to the SWPPP, and either of the following requirements is met:

- the entire site is temporarily stabilized, or
- runoff is unlikely due to winter conditions (e.g. the site is covered with snow, ice or the ground is frozen)

The Engineer may waive winter monthly inspection requirements until one month before thawing conditions are expected to result in a discharge, if all of the following requirements are met:

- below-freezing conditions are anticipated to continue for more than one month
- land disturbance activities have been suspended, and
- beginning and ending dates of the waiver period are documented as an amendment to the SWPPP.

The Engineer may waive requirements for updating the Grading and Stabilization Activities Log and Daily Record of Rainfall form during seasonal suspension of work. Resume collecting and recording weather data on the Daily Record of Rainfall form one month before thawing conditions are expected to result in a discharge. Resume recording land disturbance and stabilization activities on the Grading Activities Log when Construction Activity resumes.

e. During Winter Work.

Conduct Joint Inspections in accordance with the inspection schedule indicated in the approved SWPPP.

Inspection frequency during winter work may be reduced to at least one inspection every month if all of the following requirements are met:

- runoff is unlikely due to winter conditions (e.g. the site is covered with snow, ice or the ground is frozen)
- approval from the Engineer
- the revised inspection frequency is documented as an amendment to the SWPPP

f. Project Completion.

Conduct Joint Inspection to ensure final stabilization is complete throughout the Project and all temporary BMPs are removed.

g. Items and Areas to Inspect.

Inspect all items and areas covered under both the Department's and the Contractor's Project eNOIs; and items and areas included in the SWPPP.

Areas referenced in the Project SWPPP that are Contractor furnished, commercially, or utility furnished, and the Department is not an operator, do not require Joint Inspection in accordance with this contract. For Contractor, commercial, or utility operator furnished areas, the Contractor or

commercial operator is solely responsible for inspecting and assuring compliance with all APDES requirements, and any other federal, state, local, or tribal permitting requirements.

h. Inspection Reports.

Use only DOT&PF SWPPP Construction Site Inspection Report, Form 25D-100 to record SWPPP inspections. Changes or revisions to Form 25D-100 are not permitted. Complete all fields included on the inspection form.

The Superintendent must sign and certify the inspection report on the day of the inspection, and must provide the report to the Engineer the same day. The Engineer will sign and certify the inspection report and will return the original to the Contractor within three working days.

Unless otherwise approved by the Engineer, insert the date six calendar days after the date of the inspection as the date each corrective action will be completed.

i. SWPPP Amendments and SWPPP Amendment Log.

The Superintendent, SWPPP Manager, or SWPPP Manger's Representative are responsible for amending the SWPPP. They shall initial amendments to the SWPPP; and update and initial DOT& PF Form 25D-114, SWPPP Amendment Log. Amend the SWPPP:

- whenever there is a change in design, construction operation, or maintenance at the construction site that has or could have significant effect on the discharge of pollutants that has not been previously addressed in the SWPPP
- if a Joint Inspection identifies the SWPPP or any portion of the SWPPP is ineffective in preventing the discharge of pollutants from the Project, that exceed applicable water quality standards
- if the Engineer or Contractor determines the SWPPP or any portion of the SWPPP is ineffective in preventing the discharge of pollutants from the Project, that exceed applicable water quality standards
- whenever an inspection identifies a problem that requires additional or modified BMPs

Amend the SWPPP narrative as soon as practicable after any change or modification, but in no case, later than seven (7) calendar days following an inspection.

Include the following information when documenting modifications to the SWPPP:

- date the action was completed
- name and AK-CESCL number of the person documenting the action
- description of the action

Update the SWPPP drawings including date, location, action taken, and initials of the person recording the action for:

- installation of BMP
- modification of BMP (including any changes to BMP typical installation details)
- removal of BMP

Keep the SWPPP Amendment Log current and submit a copy to the Engineer, including copies of any documents amending the SWPPP, prior to performing each scheduled SWPPP inspection.

Include the current SWPPP Amendment Log as an appendix to the SWPPP.

j. Corrective Action.

Action required to restore effective function of BMPs is corrective action and must be documented.

Use DOT&PF SWPPP Corrective Action Log, Form 25D-112, to document corrective actions to the SWPPP and to BMPs. The Superintendent, SWPPP Manager, or SWPPP Manger's Representative shall initial all entries on Form 25D-112.

After each inspection report has been signed and certified, update the corrective action log to include all corrective actions noted on the inspection report.

After the corrective action has been accomplished, note the action taken, and date and initial the entry.

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 as an appendix to the SWPPP.

k. Grading and Stabilization.

Use DOT&PF SWPPP Grading and Stabilization Activities Log, Form 25D-110, to record land disturbance and stabilization activities. The Superintendent, SWPPP Manager, or SWPPP Manger's Representative shall initial all entries or all dates on Form 25D-110.

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 as an appendix to the SWPPP.

l. Daily Weather Records.

Use DOT&PF SWPPP Daily Record of Rainfall, Form 25D-115, to record weather conditions at the Project. Update the form daily and include the initials of the person recording each day's entry. Submit a copy to the Engineer prior to performing each scheduled SWPPP inspection.

Include the daily record of rainfall form as an appendix to the SWPPP.

157-3.4 EROSION, SEDIMENT, AND POLLUTION CONTROL PRICE ADJUSTMENT. The total value of this contract will be adjusted as specified herein. A price adjustment, under Item P-157e, will be assessed as follows.

a. Fines and Penalties: A Price adjustment equal to any penalties and fines levied against the Department by local, state, or federal agencies for pollutant violations, including violations of the CWA and the CGP, except when due to Department negligence. An amount equal to the anticipated penalties and fines for the violation or violations, excluding any due to negligence by the Department, will be withheld temporarily until the actual cost of the penalties and fines is known. Anticipated penalties and fines will be determined by the Engineer. The Contractor is also responsible for the payment of penalties and fines levied against the Contractor.

b. Failure to Stabilize Area of Land Disturbance.

- Failure to stabilize a project prior to Seasonal Thaw - $5,000/project/year.

c. Failure to Perform Inspections:

By each 24 hour period per occurrence, a price adjustment of $750 will be assessed where the Contractor:

- delayed a SWPPP inspection
- did not sign a SWPPP inspection
- did not certify a SWPPP inspection
- did not complete a SWPPP inspection in accordance with the schedule identified in the approved SWPPP

By each project, a price adjustment of $2000 will be assessed where the Contractor does not complete a pre-construction inspection.

d. Failure to Perform Corrective Action. By each 24 hour period following 24 hours after written notice by the Engineer, per occurrence, a price adjustment of $750 will be assessed where the Contractor:

- fails to complete SWPPP administrative requirements as identified in the Contract or the CGP
- fails to initiate work required by the SWPPP, not to exceed $250,000 per year, or
- fails to initiate corrective action to respond to a deficiency noted during an inspection or by the Engineer.

The same deficiency remaining uncorrected will be considered an additional occurrence for each additional 24 hour period, without requiring additional written notice by the Engineer.

157-4.1 METHOD OF MEASUREMENT. Section 90 and as follows:

~~Items P-157a and P-157c will not be measured for payment.~~

Item P-157b and P-157d will be measured ~~in the manner~~ as specified in the Contract or directive authorizing the work.

157-5.1 BASIS OF PAYMENT. The Bid Schedule will include either items P-157a and P-157b or items P-157a, P-157c, and P-157d. The Bid Schedule may, or may not include items P-157e and P-157f. When item P-157f does not appear in the Bid Schedule, the SWPPP Manager is subsidiary to other items of work.

a. Item P-157a 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, ~~plan preparation, plan amendments and updates~~SWPPP and HMCP and SPCC preparation, agency fees for SWPPP reviews, SWPPP amendments, inspections, monitoring, reporting, and all record-keeping related to the SWPPP and required by the CGP.

b. Item P-157b Temporary Erosion, Sediment and Pollution Control. At the contingent sum prices specified in the Contract or Directive authorizing the work to install, ~~and~~ maintain, remove, and dispose of temporary erosion, sedimentation, and pollution control measures required to complete the project using the approved SWPPP, SPCC, and HMCP.

c. Item P-157c Temporary Erosion, Sediment, and Pollution Control. At the contract lump sum price ~~shown on the bid schedule~~ to install, ~~and~~ maintain, remove, and dispose of temporary erosion, sedimentation, and pollution control BMPs identified in the ESCP, and for BMPs and other measures included in the HMCP and SPCC. ~~measures according to the original approved SWPPP and HMCP.~~

d. Item P-157d Temporary Erosion, Sediment, and Pollution Control Additives ~~Amendments~~. At the contingent sum prices specified in the Directive ~~to install and maintain temporary erosion, sedimentation, and pollution control measures~~ for extra, additional, or unanticipated work to install, maintain, remove, and dispose of temporary erosion, sedimentation, and pollution control measures. All work paid under this item will ~~shall~~ be shown as amendments to the original approved SWPPP or HMCP.

e. **Item P-157e Erosion, Sediment, and Pollution Control Price Adjustment.** As specified in subsection P-157-3.4.

f. **Item P-157f SWPPP Manager.** At the contract lump sum price for a SWPPP Manager and SWPPP Manager's Representative that conforms to this specification.

Temporary erosion, sediment and pollution control measures that are required at Department furnished, Contractor furnished, or commercial operator furnished material sources, disposal sites, haul routes, fuel and material storage areas, and at equipment or material staging areas, will not be paid for separately but are subsidiary to other items of work. Work required by the HMCP and SPCC including hazardous material storage, containment, removal, cleanup and disposal, are subsidiary to other items of work.

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

Work that is paid for directly or indirectly under other pay items will not be measured and paid for under this Section P-157. This work includes but is not limited to dewatering, shoring, bailing, permanent seeding, installation and removal of temporary work pads, temporary accesses, temporary drainage pipes and structures, diversion channels, settling impoundment, filtration, etc.

Temporary erosion, sediment, and pollution control measures that ~~you perform, that~~ are required due to ~~your~~ negligence, carelessness, or failure to install permanent controls as ~~a part of the work as~~ scheduled or ordered by the Engineer, or for ~~your~~ the Contractor's convenience, ~~will not be paid for~~ are at the Contractor's expense.

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

If, after 24 hours following written notice by the Engineer, the Contractor fails to pursue work required by the SWPPP, respond to inspection recommendations or deficiencies in the SWPPP, or implement erosion and sedimentation controls identified by the Engineer, or fails to perform any of the contract obligations, the Engineer may employ others to correct the condition and deduct the cost from the Contract amount.

The Engineer may suspend earthwork operations and withhold any monies due the Contractor for failure to:

- perform SWPPP Administration
- perform timely SWPPP inspections
- update the SWPPP
- transmit SWPPP, SWPPP Inspection Reports, and associated Section P-157 submittals to the Engineer
- maintain effective BMPs that minimize erosion, control sediment, or prevent discharge of pollutants that exceed applicable water quality standards
- perform duties in accordance with the requirements of this Section P-157
- meet requirements of the CGP, SWPPP, or other permits, laws, and regulations related to erosion, sediment, or pollution control

The Contractor shall be due no additional monies or Contract time extension as result of delays resulting from suspension of earthwork for failure to perform required erosion, sedimentation, or pollution duties as outlined in this Section P-157.

Payment will be made under:

Item P-157a	Erosion, Sediment, and Pollution Control Administration - per lump sum
Item P-157b	Temporary Erosion, Sediment, and Pollution Control - per contingent sum
Item P-157c	Temporary Erosion, Sediment, and Pollution Control - per lump sum

Item P-157d	Temporary Erosion. Sediment, and Pollution Control Additives ~~Amendments~~ – per contingent sum
Item P-157e	Erosion, Sediment, and Pollution Control Price Adjustment – per contingent sum
Item P-157f	SWPPP Manager – per lump sum

ITEM P-208 AGGREGATE SURFACE COURSE

DESCRIPTION

208-1.1 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

208-2.1 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 minimum degradation value of 45 when tested according to ATM 313.~~ 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.

208-2.2 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%~~ 90% by weight of material retained on the No. 4 sieve shall have ~~one~~ two or more fractured faces, when tested according to WAQTC FOP for AASHTO ~~TP 61~~ T 335.

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

208-2.3 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.

208-2.4 GRADATION. The gradation of the uncrushed or crushed material shall meet the requirements of the gradations indicated in Table 1, when tested according to WAQTC FOP for AASHTO T 27/T 11.

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 25 and a plasticity index not more than 6, when tested according to WAQTC FOP for AASHTO T 89 and T 90.

208-2.5 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

208-3.1 (Not Used)

208-3.2 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.

208-3.3 METHODS OF PRODUCTION.

a. **Plant Mix.** When selected by the Contractor and approved by the Engineer, the material shall be uniformly mixed in an approved plant.

b. **Travel Plant.** When the use of a traveling plant is approved by the Engineer, the plant shall mix the materials in a single pass. If needed to achieve optimum moisture, water shall be thoroughly mixed with the aggregates during this operation.

   If using a windrow-type of travel plant, the windrows shall be placed parallel to the embankment centerline. The windrow volume shall be sufficient to cover exact areas as planned. The windrow contents shall produce a mixture of the required gradation and bonding qualities.

   If using a travel plant that mixes previously spread aggregates in-place, the material shall have been spread in such thickness and proportions as may be handled by the machine to develop a course of the thickness of each layer and of the gradation required.

c. **Materials of Proper Gradation.** Material which meets the requirements for quality, gradation, and consistency, and which contains approximately the proper moisture for compaction, may be placed directly on the grade, without further mixing.

   Any minor deficiency or excess of moisture may be corrected by surface watering or by aeration. Some mixing or manipulation may be required immediately preceding compacting to obtain the required moisture content.

208-3.4 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 uncompacted, 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.

~~The Contractor shall install test strips of aggregate surface course with minimum dimensions of 100 feet by 16 feet by typical section thickness in an area heavily traveled by construction equipment, as approved by the Engineer. The stability and compaction characteristics of the material will be observed. The percentage of material passing the No. 200 sieve will be varied within the limits specified in the gradation in the Special Provisions while the stability and compaction are investigated.~~

~~The test strip results will be used to define the final gradation to be placed on the project based on the stability characteristics. Once the optimum percentage of fines passing the No. 200 sieve has been determined, it shall not vary more than ±2% from the optimum. Separate test strips are required for aggregate surface course from each materials source, if more than one source is used.~~

~~No aggregate surface course shall be placed on the project, other than in the test strips, until the Engineer has determined which percentage of fines performs most satisfactorily and results in the best stability. Test strip material accepted by the Engineer will be measured for payment.~~

208-3.5 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 approximately that required to obtain maximum density.

208-3.6 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 WAQTC FOP for AASHTO T99/T 180 or ATM 212. The in-place field density and moisture content will be determined according to WAQTC FOP for AASHTO T 310. If the specified density is not attained, the material shall be reworked and/or recompacted until the specified density is reached.

208-3.7 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 recompacted.

208-3.8 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.

208-3.9 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.

208-3.10 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

208-4.1 Aggregate Surface Course will be weighed by the ton or measured by the cubic yard in final position according to Subsection GCP-90-02.

BASIS OF PAYMENT

208-5.1 Aggregate Surface Course will be paid for at the contract price, per unit of measurement, accepted in place.

Payment will be made under:

Item P-208a	Crushed Aggregate Surface Course - per cubic yard
Item P-208b	Uncrushed Aggregate Surface Course - per cubic yard
Item P-208c	Crushed Aggregate Surface Course - per ton
Item P-208d	Uncrushed Aggregate Surface Course - per ton

TESTING REQUIREMENTS

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
ATM 212	The Standard Density of Coarse Granular Materials Using the Vibratory Compactor
ATM 313	The Degradation Value of Aggregates
WAQTC FOP for AASHTO T 27/T 11	Sieve Analysis of Aggregates & Soils
WAQTC FOP for AASHTO T 89	Liquid Limit of Soils
WAQTC FOP for AASHTO T 90	Plastic Limit and Plasticity Index of Soils
WAQTC FOP for AASHTO T 99/T 180	Moisture-Density Relations of Soils
WAQTC FOP for AASHTO T 310	In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods
WAQTC FOP for AASHTO ~~TP 61~~ T 335	Percentage of Fracture in Coarse Aggregate

ITEM P-660 RETROREFLECTIVE MARKERS AND CONES

DESCRIPTION

660-1.1 Remove and salvage existing airport retroreflective threshold markers and cones. ~~Furnish and install~~ Furnish tethers and install the salvaged airport retroreflective markers and traffic cones in accordance with the plans, the safety plan, and the specifications at the locations indicated on the plans or as directed by the Engineer. Assemble and install markers using all materials and incidentals necessary to place completed markers into operation to the satisfaction of the Engineer. ~~Remove existing reflective marker cones and threshold markers for salvage and offer to the owner for possession.~~

MATERIALS

660-2.1 MARKERS.

a. **Type I Marker.** Semi-flush centerline marker conforming to FAA AC 150/5345-39x, "Specification for L-853. Runway and Taxiway Lighting Retroreflective Markers" and certified under AC 150/5345-53 *Airport Lighting Equipment Certification Program.*

b. **Type II Marker.** Elevated marker for edge marking conforming to FAA AC 150/5345-39x, "Specification for L-853. Runway and Taxiway Lighting Retroreflective Markers" and certified under AC 150/5345-53 *Airport Lighting Equipment Certification Program.* Provide flexible or frangible markers in accordance with the height, marker colors, and retro-reflective colors shown on the plans. If not called on the plans, provide a finished marker height that is 30 inches above finish grade, marker color orange, and retroreflective colors as required by AC 150/5345-39x. If frangible markers are supplied, ensure that the mounting system and tether are certified. When retro-reflective sheeting is used, provide manufacturer applied sheeting.

c. **Cone, 18 Inch.** Reflective rubber traffic cone, 18 inches in height, orange color. Traffic cone model number 18-AOR, as manufactured by Radiator Specialty Company, P.O. Box 34689, Charlotte, N.C. 28234-6080 or approved equal. Fit each cone with a 7-inch wide band of retro-reflective sheeting centered on the cone. Use pressure sensitive, flexible, high intensity retroreflective sheeting, conforming to AASHTO M 268, Type III-A. Use retroreflective sheeting 3M #3800 or approved equal. Provide the appropriate sheeting color(s) as indicated on the plans or if none is indicated supply with white colored band. Provide each cone with an anchoring tether of weather and corrosion resistant material capable of securing the assembly to prevent foreign object debris (FOD) hazard to aircraft similar to the tether required for Type II Markers that are frangible.

CONSTRUCTION REQUIREMENTS

660-3.1 Install salvaged markers and/or cones at the locations shown on the plans, called for in the specifications or as directed by the Engineer. Stabilize Type II Markers by using the manufacturer's recommended methods of driving the supporting posts into the ground or providing a certified mounting system. If frangible Type II Markers or cones are provided, secure the tether to a hard point in accordance with AC 150/5345-39x per the manufacturer's recommendations.

Remove existing reflective markers and threshold marking panels as shown on the plans or as directed for salvage and offer to the owner for possession. Markers not claimed by the owner become the property of the Contractor to be disposed of in a manner approved by the Engineer.

METHOD OF MEASUREMENT

660-4.1 The method of measurement will be by the number of markers or cones furnished and installed of the specified type, at locations approved by the Engineer.

Removal and salvaging of existing markers, cones and panels will be subsidiary to the installation of reflective markers and/or cones and will not be measured for payment.

BASIS OF PAYMENT

660-5.1 Payment will be made at the contract unit price for each furnished and accepted item. This price will be full compensation for furnishing all materials, for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item P-660a	Reflective Marker, Type I - per each
Item P-660b	Reflective Marker, Type II - per each
Item P-660c	Cone, 18 Inch - per each

SECTION P-686 FIBER ROLL

DESCRIPTION

686-1.1 Furnish, place, maintain, and remove fiber rolls as shown on the Plans or as directed.

MATERIALS

686-2.1 FIBER ROLL. Fiber Rolls shall be constructed with a pre-manufactured blanket consisting of either wood excelsior, rice or wheat straw, or coconut fibers or a combination of these materials. The blanket shall be between 6 feet and 8 feet in width and between 65 feet and 95 feet in length. Wood excelsior shall be individual fibers, of which 80 percent shall be 6 inches or longer in length. The blanket shall have a photodegradable plastic netting or biodegradable jute, sisal, or coir fiber netting on at least one side. The blanket shall be rolled along the width and secured with jute twine spaced 6 feet apart along the full length of the roll and placed 6 inches from the ends of each roll. The finished roll shall be between 8 inches and 10 inches in diameter, a minimum of 20 feet in length, and shall weigh a minimum of 0.5 pound per linear foot. More than one blanket may be required to achieve the finished roll diameter. When more than one blanket is required, blankets shall be jointed longitudinally with an overlap of 6 inches along the length of the blanket.

686-2.2 STAKES. Wood stakes shall be a minimum of 1"x1"x24" in size. Wood stakes shall be untreated fir, redwood, cedar, or pine and cut from sound timber. They shall be straight and free of loose or unsound knots and other defects which would render them unfit for the purpose intended. Metal stakes shall not be used.

CONSTRUCTION REQUIREMENTS

686-3.1 Install fiber rolls before excavation or embankment construction begins.

686-3.2 INSTALLATION. Fiber rolls shall be installed as follows:

A. Furrows shall be constructed to a depth between 2 inches and 4 inches, and to a sufficient width to hold the fiber roll. Stakes shall be installed 24 inches apart along the length of the fiber rolls and stopped at 12 inches from each end of the rolls. Stakes shall be driven to a maximum of 2 inches above, or flush with the top of the roll.

B. Fiber rolls shall be placed 10 feet apart along the slope for slope inclination (horizontal:vertical) of 2:1 and steeper, 15 feet apart along the slope for slope inclination of 2:1 and 4:1, 20 feet apart along the slope for slope inclination between 4:1 and 10:1, and a maximum of 50 feet apart along the slope for slope inclination of 10:1 and flatter.

C. The bedding area for the fiber roll shall be cleared of obstructions including rocks, clods, and debris greater than one inch in diameter before installation.

D. Fiber rolls shall be installed approximately parallel to the slope contour.

E. Fiber rolls shall be installed before the application of other temporary erosion control or soil stabilization materials in the same area.

686-3.3 MAINTENANCE AND REMOVAL. Fiber rolls shall be maintained to disperse concentrated water runoff and to reduce runoff velocities. Split, torn, or unraveled rolls shall be repaired or replaced. Broken or split stakes shall be replaced. Sagging or slumping fiber rolls shall be repaired with additional stakes or replaced. Locations where rills or other evidence of concentrated runoff have occurred beneath the rolls shall be corrected. Fiber rolls shall be repaired or replaced within 24 hours of identifying the deficiency.

When no longer required, as determined by the Engineer, fiber rolls shall be removed and disposed. The fiber rolls may be abandoned in place when approved in writing by the Engineer. If approved, the stakes shall be removed or pounded into the ground.

METHOD OF MEASUREMENT

686-4.1 Fiber rolls shall be measured by the linear foot measured along the centerline of the installed roll. Where fiber rolls are joined and overlapped, the overlap will be measured as a single installed roll.

BASIS OF PAYMENT

686-5.1 Payment will be made at the contract unit price per linear foot for fiber roll. Payment includes full compensation for furnishing all labor, materials, tolls, equipment, and incidentals, and for doing all the work involved in stalling fiber rolls, complete in place, including furrow excavation and backfill, maintenance, and removal. Damage to fiber rolls resulting from the Contractor's vehicles, equipment, or operations shall be repaired at the Contractor's expense. If the following pay item is absent from the bid schedule, no payment will be made. All work, materials, and equipment required to complete the work will be subsidiary to pay item P-157b Temporary Erosion, Sediment and Pollution Control.

Payment will be made under:

Item P-686a Fiber Roll – per linear foot

ITEM S-142 EQUIPMENT STORAGE BUILDING

DESCRIPTION

142-1.1 Furnish all labor, materials and equipment required to construct a new snow removal equipment building at the location indicated on the plans. Comply with the building technical specifications located in Appendix L for work on the building and related systems. Wherever the words "this Contract" are found in the attached specifications, it is understood to denote "this work".

This item will construct the new equipment storage building(s) on a new or existing building pad.

MATERIALS

142-2.1 Materials required to perform this work are outlined in the building technical specifications in Appendix L except as specified in subsection 142-6.1. Comply with section 60-08 for submittals.

CONSTRUCTION REQUIREMENTS

142-3.1 Comply with the plans and specifications outlined in the building technical specifications in Appendix L except as specified in subsection 142-6.1. Submit plans and working drawings in accordance with section 50-02.

TESTING

142-4.1 Perform testing in conformance with the plans and specifications outlined in the building technical specifications in Appendix L except as specified in subsection 142-6.1.

METHOD OF MEASUREMENT

142-5.1 This item will not be measured for payment. The Engineer's acceptance constitutes measurement.

BASIS OF PAYMENT

142-6.1 Payment will be made at the contract lump sum price for construction of the building and related systems. This item provides full compensation for this work to include the building and internal systems.

Bollards external to building walls, all required mobilization/demobilization, surveying required for this work, airport lighting equipment, and standard signs are specified and paid for under items F-170, G-100, G-135, L series specifications, and P-661.

Earthwork associated with construction of the building pad, including the area within the building boundary line, will be specified, measured, and paid for under the appropriate earthwork (P series) bid items. Excavation and backfill of building foundation and footings will be subsidiary to item S-142p.

Payment will also include all labor and materials necessary to connect the fuel oil tank furnished under Item S-143 with the appropriate building heating system.

Payment will be made under:

Item S-142p Equipment Storage Building – per lump sum

ITEM S-143 FUEL TANK

DESCRIPTION

143-1.1 This item consists of furnishing and installing a protected aboveground motor vehicle fuel or heating oil tank complete with fuel and accessories as specified. Prepare for Department use, an EPA approved Spill Prevention, Control and Countermeasure Plan (SPCC plan).

MATERIALS

143-2.1 TANK. Provide skid-mounted, doublewall, aboveground steel tank. The tank shall be of the type and capacity shown in the bid schedule. Equip tank with accessories as shown on the Plans and as follows:

a. **Overfill Alarm.** Provide a mechanical, audible overfill alarm, Ventalarm Signal as manufactured by Scully Signal Company, 70 Industrial Way, Wilmington, MA 01887 or approved equal.

b. **Automatic Shut-Off Device.** Provide a positive closing, mechanical, automatic shut-off device. Clay & Bailey model F-30 as manufactured by Clay and Bailey Manufacturing Co., 6401 East 40th Street, Kansas City, MO 64129 or approved equal.

c. **Tank-Mounted Mechanical Fuel Gauge.** Provide mechanical gauge with 12-hour clock face in feet and inches readout, activated by a stainless steel float connected to a stainless steel cable. Morrison Model 818 as manufactured by Morrison Bros. Co., P.O. Box 238, Dubuque, Iowa 52004 or approved equal.

d. **Openings.** Provide the following threaded openings and accessories on tank top:
One 2-inch Interstitial Monitoring with plug
One 2-inch Normal Vent with screen
One 2-inch Product fill opening with locking cap
One 2-inch Product pump opening with plug
One 2 to 4-inch Liquid level gauge
One 4 to 8-inch Emergency vent with plug, primary tank
One 4 to 8-inch Emergency vent with plug, secondary tank
No Drain Opening at bottom

e. **Exterior Coating.** Abrasive blast the exterior surface of the outer tank according to SSPC-SP 6. Coat the exterior surface with 8 mils total thickness of epoxy paint base and urethane paint finish.

f. **UL Labeling.** Heating oil tanks shall be manufactured and labeled according to UL 142. Motor vehicle fuel tanks shall be manufactured and labeled according to UL 142 and UL 2085.

g. **Insulation.** For motor vehicle fuel tanks install 3-inch thickness of insulation according to ASTM C-332 and ASTM C-495.

When a motor vehicle fuel-dispensing tank is specified, it shall meet or exceed the requirements of UL 2085, Underwriters Laboratories Standard for Safety for Protected Aboveground Tanks for Flammable and Combustible Liquids. Equip with a threaded opening for the specified fuel pump.

Tanks larger than 2,500 gallons require additional openings and accessories for UL rating.

143-2.2 MANUAL DISPENSING SYSTEM. Provide a double-action pump, equipped with detachable, self-venting bung adapter, set screws and strainer screen. Provide a dispensing system that is not gravity fed. The pump shall have 16 feet of 3/4-inch diameter hose with shut-off nozzle and deliver a minimum of 20 gallons/100 strokes. The pump supplied shall be a Gasboy, Model 1720, or approved equal.

143-2.3 ELECTRIC DISPENSING SYSTEM. Provide an electric suction or submerged turbine pump with a delivery rate up to 18 gpm, 3-wheel, meter-register with reset and non-resettable 6 digit master totalizer in a cabinet, anti-siphon valve with internal pressure relief, gate valve, canister style fuel filter, flow meter, 20 ft fuel hose with swivel and breakaway coupling, hose retractor, OPW 11-A automatic nozzle with lockable nozzle holder, explosion proof pump activation switch, emergency pump shutoff switch mounted on the SRE building, warning signs, and BC fire extinguisher per International Fire Code (IFC) chapter 2201 - 2206.

143-2.4 FUEL. No. 1 diesel or No. 1 heating oil, depending on tank use.

CONSTRUCTION REQUIREMENTS

143-3.1 INSTALLATION. Install according to the International Fire Code (IFC) chapters 22 and 34 for the type of tank specified. Mount and secure the tank on the skid base. Install dispensing system to include all fittings and hose. Install wiring of the pump and emergency shut off according to National Fire Protection Association (NFPA) 30 and the current edition of the National Electrical Code (NEC) for hazardous locations. Place tank at the location shown on the Plans, or as directed. Set automatic shut-off device to 90% capacity. Fill to 90% capacity with specified fuel.

143-3.2 SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN (SPCC). Provide for Department use after tank installation, an EPA approved SPCC plan for the motor vehicle fuel or heating oil tank, that is certified by a licensed professional engineer. (See http://www.epa.gov/oilspill/lawsregs.htm for SPCC plan requirements).

Comply with 40 CFR 112 and address the following issues in the SPCC Plan:

- **a.** Operating procedures that prevent oil spills;
- **b.** Control measures installed to prevent a spill from reaching navigable waters; and
- **c.** Countermeasures to contain, clean up, and mitigate the effects of an oil spill.

The Contractor shall coordinate with the Department to identify oil spill response resources. The SPCC Plan shall take into account the Department's on-site equipment, oil spill containment material, cleanup material, and personnel; and shall make recommendations for future improvements in these areas.

Provide two (2) copies of the SPCC Plan; deliver one to the Engineer to be retained at the site and deliver the other to the Department's Statewide Safety Officer at 5300 E. Tudor Drive, Anchorage, AK, 99507.

METHOD OF MEASUREMENT

143-4.1 Subsection GCP-90-02 and as follows:

- **a.** Lump Sum. No measurement of quantities will be made.

- **b.** Unit Prices. The quantity to be paid for will be the number of units installed, complete, in place, accepted, and ready for operation.

BASIS OF PAYMENT

143-5.1 At the contract unit price for the pay items listed below that appear in the bid schedule. Heating fuel distribution and delivery systems are measured and paid for under Item S-142.

Payment will be made under:

Item S-143a	Heating Fuel Tank 1000 Gallon - per each
Item S-143b	Fuel - per lump sum
Item S-143c	Manual Dispensing System – per each
Item S-143d	Electric Dispensing System – per each
Item S-143e	Motor Vehicle Fuel-dispensing Tank 1000 Gallon – per each
Item S-143f	Spill Prevention Control and Countermeasure Plan - per lump sum

ITEM T-901 SEEDING

DESCRIPTION

901-1.1 This work consists of preparing the ground and applying seed and fertilizer in conformance with the Plans and Specifications.

The intent of this work is to provide a living vegetative cover in the areas indicated on the Plans and to maintain the cover for the term of the Contract.

MATERIALS

901-2.1 SEED. ~~Furnish the seed mixture listed in the Special Provisions.~~ Furnish the following seed mixture:

40% Norcoast Bering Hairgrass
40% Arctared Red Fescue
20% Boreal Red Fescue

Meet the applicable requirements of the State of Alaska Seed Regulations, 11 AAC 34, Articles 1 and 4.

Meet or exceed 95% pure seed and 74% germination.

Furnish 4 signed copies of a report for each lot of seed, certifying it has been tested by an approved laboratory within 9 months of date of seed application. Submit these certifications no later than 10 days prior to seeding. Include the following in each certification:

a. name and address of laboratory
b. date of test
c. lot number
d. seed name
e. percent pure seed
f. percent germination
g. percent weed content
h. percent inert matter

901-2.2 FERTILIZER. Furnish a 20-20-10 fertilizer containing no cyanamid compounds or hydrated lime. Tolerances of the chemical ingredients shall be plus or minus 2%.

Use standard commercial fertilizer supplied separately or in mixtures, and in moisture proof containers. Mark each container with the total net weight and with the manufacturer's guaranteed analysis of the contents showing the percentage for each ingredient.

CONSTRUCTION METHODS

901-3.1 SOIL PREPARATION. Clear all areas to be seeded of stones 4 inches in diameter and larger and of all sticks, stumps, noxious weeds, and other debris or irregularities that might interfere with the seeding operation, growth of grass, or subsequent maintenance of the grass covered areas.

Just prior to seeding, roughen the surface of all areas to be seeded by track-walking transversely up and down the slopes or using a scarifying slope board. Round the top and bottom of the slopes, when necessary, to facilitate tracking and to create a pleasing appearance, but do not disrupt drainage flow lines. Where fill is adjacent to wetlands, keep the equipment entirely on the fill slope.

901-3.2 SEEDING SEASONS. Seed and fertilize between May 15 and August 15.

Do not seed during windy conditions or when climatic conditions or ground conditions would hinder placement or proper growth.

901-3.3 APPLICATION. ~~Apply seed and fertilizer at the rates specified in the Special Provisions.~~ Apply seed at the rate of 50 lbs. per acre. Apply fertilizer at the rate of 450 lbs. per acre. Use either of the following methods:

a. **Hydraulic Method.**

(1) Mix a slurry of seed, fertilizer, water, and other components as required by the Special Provisions. Add seed to the slurry mixture no more than 30 minutes before application.

(2) Use hydraulic seeding equipment that will maintain a continuous agitation and apply a homogeneous mixture through a spray nozzle. The pump must produce enough pressure to maintain a continuous nonfluctuating spray that will reach the extremities of the seeding area, without causing damage to the seed bed. Use a hose attachment to reach areas where a fixed nozzle cannot reach.

(3) If mulch material is required, add it to the water slurry in the hydraulic seeder after adding the proportionate amounts of seed and fertilizer.

(4) Apply slurry at a rate that distributes all materials evenly.

b. **Dry Method.**

(1) Use mechanical spreaders, seed drills, landscape seeders, cultipacker seeders, fertilizer spreaders, or other approved mechanical spreading equipment.

(2) Moisten the soil prior to the application of seed and fertilizer and immediately afterwards.

(3) Mix or rake the seed and fertilizer into the seed bed to a depth of 1/2 inch, unless mulch material is to be applied immediately.

901-3.4 MAINTENANCE OF SEEDED AREAS. Protect seeded areas against traffic using approved warning signs or barricades. Promptly repair surfaces that are gullied or otherwise damaged following seeding by regrading and reseeding, as directed. Maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

Keep temporary erosion control measures in place until the vegetation is accepted.

Water the seeded areas, as required, for proper germination and growth. Use equipment that can acceptably water all seeded areas without vehicular traffic on seeded areas.

Reseed any seeded areas not showing evidence of satisfactory growth, as directed.

Final acceptance will be based on the following criteria and must provide 70% vegetative coverage of the seeded area. If seeding is completed by July 15th, coverage must be attained by September 30th. If seeding is completed by August 15th, coverage must be attained by June 15th of the following season. Final acceptance will be based on the Engineers approval.

METHOD OF MEASUREMENT

901-4.1 The work will be measured according to Subsection 90-02, and as follows:

a. **Seeding by the acre.** By the area of ground surface acceptably seeded, fertilized, and maintained. Required reseeding is subsidiary.

b. **Seeding by the pound.** By the weight of seed acceptably placed. Fertilizer is subsidiary. Any other work required will be measured separately.

c. **Water for maintenance.** By the M-gal (1,000 gallons) acceptably placed. Use a conversion factor of 8.34 pounds per gallon, if measured by weight. Use a conversion factor of 7.48 gallons per cubic foot, if measured by volume.

BASIS OF PAYMENT

901-5.1 At the contract unit price per unit of measure for the pay items listed below that appear on the bid schedule.

Water for hydraulic application of seed mixtures is subsidiary. Water for maintenance is subsidiary except when it is listed in the bid schedule.

Mulching will be measured and paid for under Item T-908.

Payment will be made under:

Item T-901a	Seeding - per acre
Item T-901b	Seeding - per pound
Item T-901c	Water for Maintenance - per M-gal

ITEM T-908 SOIL STABILIZATION

DESCRIPTION

908-1.1 This work consists of furnishing, placing, and maintaining soil stabilization material where shown on the Plans.

MATERIALS

908-2.1 MULCH. Virgin/recycled wood fiber, recycled paper (wood cellulose), or an acceptable blend containing up to 50% recycled paper, with the following characteristics:

a. Contains no growth or germination inhibiting factors.

b. Will remain in uniform suspension in water under agitation and will blend with grass seed, fertilizer and other additives to form a homogeneous slurry, when required.

c. Will form a uniform, blotter-like ground cover on application, having moisture absorption and percolation properties and the ability to cover and hold grass seed in contact with soil.

d. Will not form a hard crust upon drying.

e. Dyed a suitable color to facilitate inspection of its placement.

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

Use a commercial tackifier on all slopes 4:1 or steeper Use the amount recommended by the manufacturer.

908-2.2 ROLLED MATTING. Use materials that conform to one of the following standards:

a. Unbleached single jute yarn. Use yarn that is loosely twisted and not varying in thickness more than one-half its normal diameter. Furnish jute mesh in rolled strips conforming to the following requirements.

(1) Width: 45 to 48 inches, ± 1 inch.
(2) 78 warp-ends per width of cloth (minimum).
(3) 41 weft-ends per yard (minimum).
(4) Weight: 1.22 pounds per linear yard, ± 5%

b. Knitted Straw Matting. Commercially manufactured erosion control blanket. Use netting which is biodegradable. Straw shall be from oats, wheat, rye, rice, or other approved grain crops that are free from noxious weeds, mold, or other objectionable material. May contain coconut or other natural fiber to reinforce the straw. Follow the manufacturer's published recommendations.

908-2.3 STAPLES. U-shaped staples for anchoring matting, approximately 6 inches long and 1 inch wide. Machine-made: No. 11 gage or heavier steel wire. Hand-made: 12-inch lengths of No. 9 gage or heavier steel.

908-2.4 Hydraulic Erosion Control Product (HECP). The HECP upon application to the soil surface will create a three-dimensional fiber matrix forming a continuous, porous, absorbent and flexible erosion resistant blanket that allows for rapid germination and accelerated plant growth. Provide an HECP that conforms to either HECP-1 or HECP-2 as follows:

a. HECP-1 consisting of thermally processed or pasteurized non toxic organic defibrated fibers, dispersible interlocking natural or synthetic fibers and a cross-linked hydro-colloidal tackifier. HECP-1 is not composed of paper, cellulose fiber, or blend of paper, cellulose, and other materials. Provide an HECP-1 that is a flexible erosion control matrix and forms a strongly lofted but porous fiber mat that contains air pockets and moisture absorbing chambers that allow for the proper germination of seeds while reducing the energy of raindrops and decreases the volume of sediment loss, or:

b. HECP-2 certified by the manufacturer to provide an equivalent level of performance to that of an HECP-1 meeting the material requirements described under "a." above. In addition, provide evidence that the HECP-2 has been shown to be at least 99% effective by testing at any of the following laboratories:

(1) San Diego State University Soil Erosion Research Laboratory, San Diego, CA

(2) Utah Water Research Laboratory at Utah State University, Logan, Utah

(3) USDA-Agricultural Research Service National Soil Erosion Research Laboratory (NSERL) at Purdue University, West Lafayette, Indiana.

(4) Texas DOT/Texas Transportation Institute (TTI) Hydraulics and Erosion Control Laboratory at Texas A & M, College Station, Texas.

Provide Flexterra FGM as manufactured by Profile Products LLC, Flex Guard as manufactured by Mat, Inc., Earth Guard Fiber Matrix as manufactured by Terra Novo, Inc., or an approved equal. Deliver materials and products in UV and weather resistant factory labeled packages. Store and handle in compliance with manufacturer's instructions and recommendations. Protect from damage from weather, excessive temperatures, and construction operations. Ensure that all components of the HECP are pre-packaged by the manufacturer to assure material performance.

CONSTRUCTION REQUIREMENTS

908-3.1 SURFACE PREPARATION. Smooth the surface and backfill all gullies and potholes before application. Remove all sticks and other foreign matter that prevents contact of the mulch , HECP, or matting and the soil. Ensure that surfaces receiving an application of HECP are geotechnically stable and constructed to divert runoff away from the face of any slopes. Do not proceed with HECP installation until satisfactory conditions are established. Ensure that the surface is moist at the time of placement. If area is to be seeded, soil preparation shall conform to Section 901-3.1.

908-3.2 APPLICATION.

a. Mulch and Matting. Apply soil stabilization material at the rate specified in the Special Provisions. If seeding is specified, complete the application of mulch or matting within 24 hours after seed is placed. Staple matting every 5 feet at overlapped joints and edges or as recommended by the manufacturer. Do not use vehicles or equipment which cause rutting or displacement of the subgrade or topsoil.

b. Hydraulic Erosion Control Product (HECP).

(1) HECP-1. Apply at a rate of 3500 lbs per acre (dry weight basis) in compliance with manufacturer's instructions and recommendations using an approved mechanically agitated, hydraulic seeding/mulching machine with a fan-type nozzle (50-degree tip). Apply from opposing directions to reduce the "shadow effect" and to achieve best soil coverage. Do not apply HECP-1 in channels, swales, or other areas where concentrated flows are anticipated, unless installed in conjunction with a temporary erosion control blanket or non-degradable turf reinforcement mat. Slope interruption devices or water diversion techniques are recommended when slope lengths exceed 100 feet and/or slopes are steeper than 3H:1V. Where surfaces are to be seeded, apply

HECP-1 in a two-step process unless a single step process is recommended by the manufacturer and approved by the Engineer. The single step process involves mixing all components in a single tank load. In step one of a two step process, mix and apply any seed and soil amendments with a small amount of HECP-1 for visual metering. In step two, mix and apply HECP-1 over freshly seeded surfaces. Do not leave seeded surfaces unprotected, especially if precipitation is imminent. Mix HECP-1 in the hydraulic application machine by filling the tank to middle of agitator shaft or 1/3 tank full of water. Turn on the pump to wet or purge lines. Begin agitating and keep adding water slowly while adding the HECP-1 at a steady rate. Consult the manufacturer's application and loading charts to determine the number of bags to be added. Mix at a rate of 50 lbs HECP-1 per 125 gallons of water. Contact the equipment manufacturer to determine optimum loading and mixing rates. All HECP-1 should be loaded when the tank is approximately ¾ full. Where fertilizer is applied with HECP-1, add it when the tank is nearly full. Before application, mix the slurry for at least 10 minutes after adding the last amount of HECP-1. This is imperative to fully activate the bonding additives and to attain proper viscosity. Turn off the recirculation valve and reduce the agitator speed to minimize the potential for air entrainment within the slurry.

(2) **HECP-2.** Apply in accordance with manufacturer's instructions, at a rate specified by the manufacturer.

908-3.3 MAINTENANCE. Reshape and reseed any damaged areas and repair the mulch, HECP, or matting as required.

Maintain the mulch, HECP, or matting until all work on the project is complete and accepted.

METHOD OF MEASUREMENT

908-4.1 By the square yard, according to Subsection GCP-90-02, acceptably placed. Water, maintenance, and repair are subsidiary.

BASIS OF PAYMENT

908-5.1 At the contract unit price per unit of measure for the pay items listed below that appear on the bid schedule.

Payment will be made under:

Item T-908a	Mulching - per square yard
Item T-908b	Rolled Matting - per square yard
Item T-908n	Hydraulic Erosion Control Product (HECP) – per square yard